50 CENTS

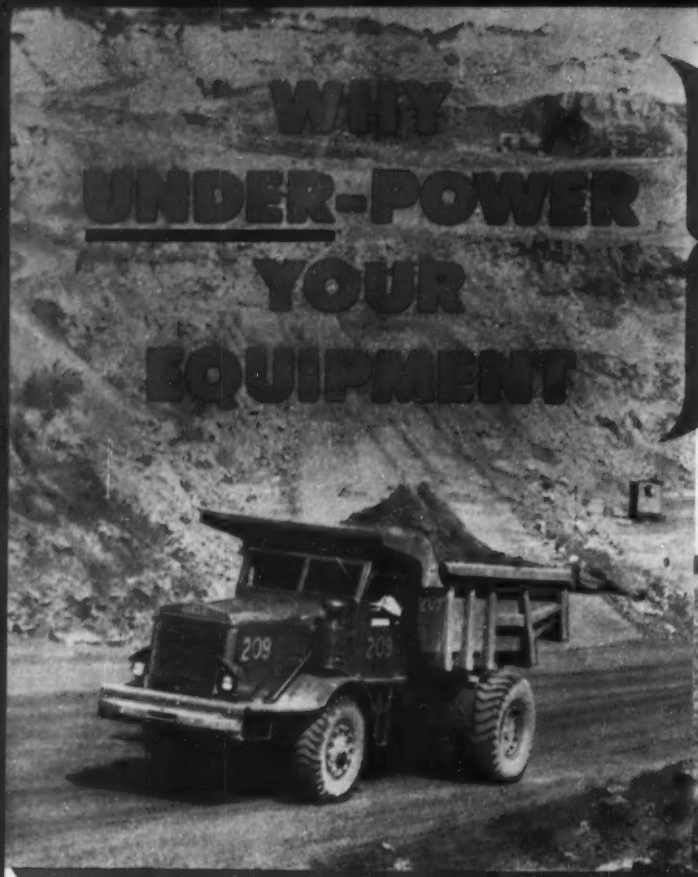
CONSTRUCTION

METHODS AND EQUIPMENT

June 1954

WHY UNDER-POWER YOUR EQUIPMENT

when BIG displacement Buda Diesels give you so many advantages?



BUDA Diesel Advantage:	Benefit To You:
● 12 to 18% MORE HORSEPOWER AT NORMAL OPERATING SPEEDS	Faster trips . . . heaped loads . . . more production . . . greater reserve . . . lower cost per yard
● 10 to 17% MORE USEABLE TORQUE	Greater lugging ability . . . less shifting and jerking . . . longer equipment life . . . reduced maintenance and downtime
● SMOOTHER, QUIETER OPERATION	Increased operator comfort . . . less exhaust fumes and smoke . . . greater efficiency . . . more production per shift
● EXCLUSIVE DYNA-SWIRL COMBUSTION	More horsepower per gallon of fuel . . . lower all around fuel costs

You can't afford *not* to know all the facts about BIG displacement Buda Diesels—the engines that will increase your production while reducing costs on every yard you move. Ask your nearby Buda Engine Distributor. He'll be glad to supply the facts. *The Buda Company, Harvey Illinois.* ***Division of Allis-Chalmers Manufacturing Company.***

BUDA
COAST TO COAST
FACTORY EXPERIENCED SERVICE AND PARTS

BUDA

a Power-Full and Dependable Engine
FOR EVERY NEED

BC-28

Manufacturers of Material Handling Equipment, Lifting Jacks, Maintenance of Way Products, Farm Drills and Diesel and Gasoline Engines

B.F.Goodrich

Tires roll from pit to plant on rock-strewn roads, defy cuts!

THE roads that connect the mining pits with the Charleson Iron Mining Company's plant at Virginia, Minn., are covered with chunks of abrasive rock and stone. Trucks roll over these roads 24 hours a day, 7 days a week, carrying 17-ton payloads.

Tire mortality could be high. This company uses B. F. Goodrich Universal tires, reports they wear longer, pull better, defy rock snags and cuts. Wedge-shaped cleats pull in either direction, protect against dangerous side-slip, give outstanding traction compared to other rock-type tires.

Under the Universal tread is the patented B. F. Goodrich nylon shock shield. Layers of strong nylon cords stretch together to absorb shocks. You save 4 ways: (1) more hours of service (2) more recappable tires and more hours of service per recap (3) increased bruise resistance (4) less danger of tread separation.

TONS OF ROCK crash onto B. F. Goodrich Universal tires that will carry the load up steep hauling roads to the plant. BFG makes a complete line of off-the-road tires.

CHARLESON'S TIRES are 95% B. F. Goodrich, preferred because the specially-compounded tread defies rock bruises. Universal tires are available in All-Nylon or rayon construction.

You pay no more

You get all these advantages, yet you pay nothing extra for the exclusive BFG nylon shock shield. Let your B. F. Goodrich retailer show you how Universal tires can save you money. His address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment

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Exclusive Features New to Power Troweling

36" Ring
$375.00
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MALL—the first power trowel that delivers 97% of engine power to the trowel blades. New direct "in-line" transmission does it...no belts or pulleys to steal valuable power.

MALL—the first power trowel with interchangeable ring sizes...36" or 45" rings, with corresponding floating shoes, finishing blades and a 24" disc for dry tamp floors, can be used with one power unit.

MALL—the first power trowel that employs a new, extra sturdy trowel ring and arm design that will not sag. These, plus many other new, exclusive features, make the new MALL POW'R TROW'L the finest performing, easiest to handle gasoline driven troweling machine you have ever experienced. GET DETAILS NOW.

MALL Nation-Wide Factory-Owned Service Warehouses Assure Fast, Dependable Service.

MALL TOOL COMPANY 7701 S. Chicago Ave. Chicago 19, Illinois

Send me full details and prices on the NEW MALL POW'R TROW'L.

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Number 6

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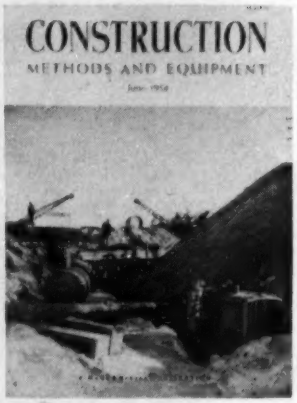

On the Cover

Around-the-clock operation, 7 days a week, is the lot of this 6-in. centrifugal Moretrench pump driven by a General Motors diesel engine. Rig is owned by United Construction Co., Grand Rapids, Mich., is pumping through a 100-ft, 6-in. pipe leader connected to 30-ft wellpoints that drain a radius of approximately 150 ft at a time. Job is construction of 30-ft deep, 4,600-ft long drain in Muskegon Heights.

COMING IN JULY: Valuable maintenance information filling one entire issue of CONSTRUCTION METHODS AND EQUIPMENT devoted entirely to helping the contractor keep his equipment productive at lowest cost for longer periods. Extra specials will be an up-to-date inventory of maintenance manuals and a report on the care of contractors' trucks.

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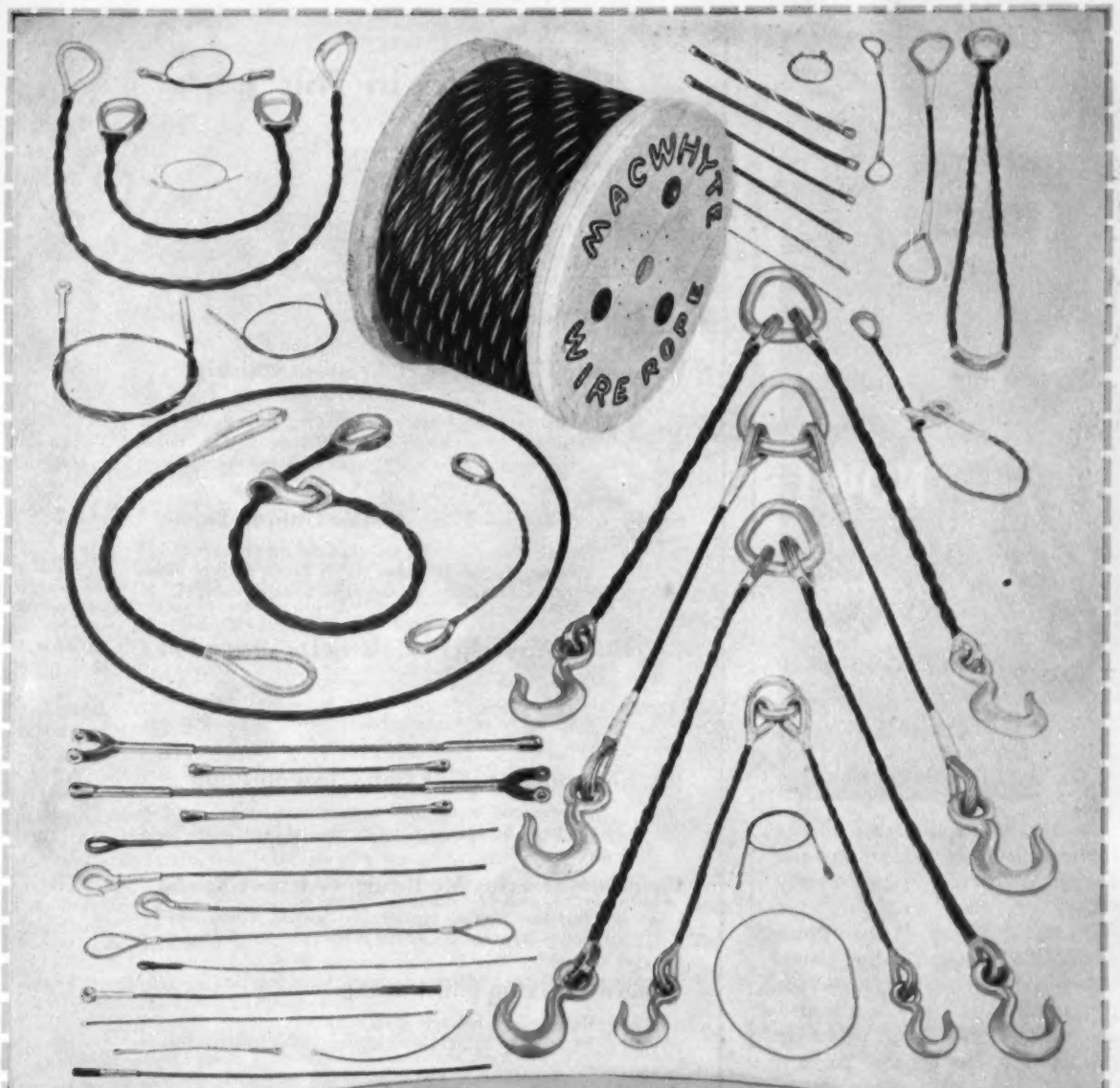

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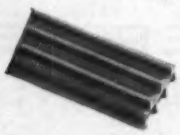

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Pay Dirt in This Issue

JUNE, 1954

Digging Tecolote Tunnel is Hot Work 54

It's not the heat, but the humidity, here where tunneling goes on in spite of 4,000 gpm ground water at 113 deg F. Dry air makes work possible. Men ride through hottest sections submerged to their necks in cool water.

Pneumatic Piles Support Army's Landship 58

Air-expanded mandrel drives 65- to 70-ft lengths of 12-in. spirally corrugated 16-gage steel shell through 10 ft of water and 40 ft of river muck to 30-ton bearing. Filled with concrete, they support precast deck and ship mockup.

Small but Tricky Pour Makes Unique Dome 67

Thin-shell roof requires less than 300 yd of concrete but takes 60,000 fbm of lumber for its 21,000 sq ft of forms. Shape is an equilateral spherical triangle rising 45 ft.

Good Methods Help Explosives Do Better Job 94

Closer study of new explosives, delay caps, blasting machines and techniques make for better fragmentation and control of throw—also improved public relations.

Big Equipment Builds Chief Joseph Plant 62

Massive steel forms, used many times over and handled by large cranes, save on equipment and labor costs.

Pavement Overlay Modernizes Airport Apron 78

Engineers beef up concrete for heavier planes; add 10- and 15-in. pavements on top of 10- and 6-in. existing slabs.

Concrete Mixing and Placing 110

Ready-mixed concrete plants are versatile, do batching for central mixing, shrink-mixing and supply transit-mix.

Attack Accidents at Their Source 144

Contractors can limit conditions that jeopardize men, increase insurance and hidden costs, lower the profits.

Men and Machines Battle Moving Mountain 158

Heavy rains set a whole mountainside sliding, pushing a railroad out of line. Earthmovers have joined battle.

Job Talk	10	Rock Bolting	162
It's Your Business	18	Corrugated Steel Floor Forms	164
Picture of the Month	42	Contractor-Labor Relations	166
Construction News in Pictures	50	Sales and Service	170
Editorial: Harold W. Richardson	52	Construction Equipment News	180
Taming of the Diesel Exhaust	76	Methods Memo	220

NEXT MONTH

Top-flight equipment maintenance is a basic key to success in construction. CM&E for July will be loaded exclusively with maintenance ideas from contractor and manufacturer. Be sure to get your copy. It is useful the year around.

Precast Bridge 2 Miles Long

122-Ton Roadway Slabs Floated into Place with Assembly-line Precision on Bay St. Louis Bridge, Mississippi

119,035 BBLS. LONE STAR AIR-ENTRAINING CEMENT USED

● First conceived as a cast-in-place structure, substantial time and money savings were realized by precasting the roadway of this 4-lane, 10,189-ft. bridge carrying U. S. 90 across the Bay of St. Louis.

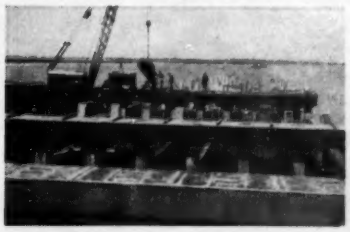
Concrete pile bents on 41-ft. centers support the precast bridge deck. The 2456 concrete piles and 478 half-width roadway units were fabricated at an onshore casting yard near job site.

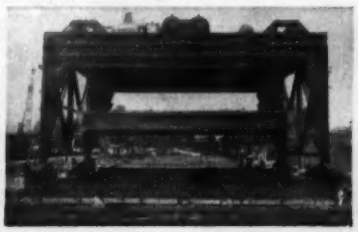
Roadway units, each 27½ x 41 ft., containing 57½ cu. yd. concrete and weighing 122 tons, were moved by gantry to barge, towed to bridge line, and lowered into position by gradually flooding barge ballast compartments.

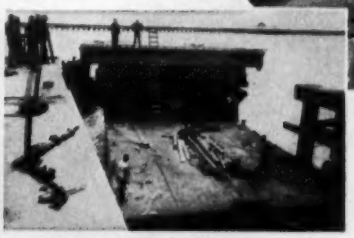
Work on the $6.5-million structure, proceeding from both shores to mid-way juncture, was completed 18 months after driving first pile.

A construction achievement of first rank, made possible by assembly-line precision at every stage—including perfect timing of material deliveries. You could set your watch by dependable schedules on which 119,035 bbls. of LONE STAR AIR-ENTRAINING PORTLAND CEMENT were delivered. The notable workability of this cement helped speed placing and finishing. Extra durability assures long-time, fire-safe service—lowest annual cost.

STATE OF MISSISSIPPI—Toll Project No. 1 (Contract No. 1)
BAY ST. LOUIS BRIDGE, between Bay St. Louis and Henderson Point
Supervision: **MISSISSIPPI STATE HIGHWAY DEPARTMENT**
Designed by: **HAZELET & ERDAL**, Consulting Engineers, Louisville, Ky.
General Contractor: **MERRITT-CHAPMAN & SCOTT CORPORATION**, New York







LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

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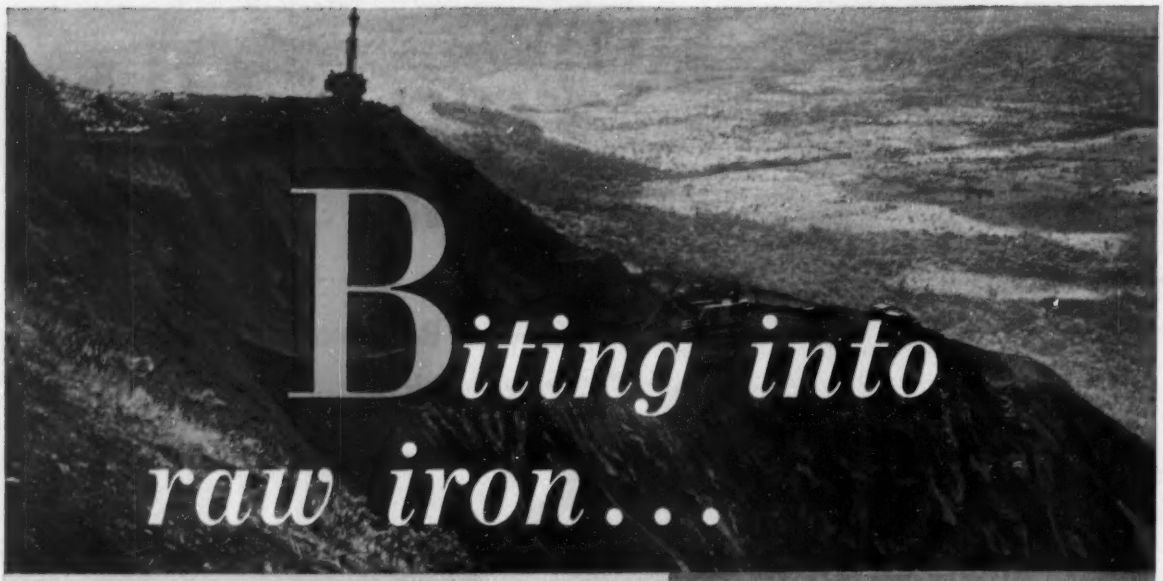
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 136,000,000 SACKS ANNUAL CAPACITY



Biting into raw iron...

Two years of tough, schedule-smashing construction by the men of Morrison-Knudsen Company made possible the first shipment of ore from Venezuela's Cerro Bolivar, for the United States Steel Corporation.

To reach the ore deposits, a 91-mile railroad and an 80-mile highway had to be constructed. A monthly average of 400,000 cubic yards of earth and rock was moved to prepare the railway grade alone. Part of the way, excavation was almost entirely in double-extra-hard granite, with a crushing strength of 60,000 psi. And on the southern slope of Cerro Bolivar itself, scores of side-hill cuts were made through hard layers of solid ore that graded 65% or more pure metal.

This was a job that demanded an exceptional combination of engineering skill, determination, and the best of construction and drilling equipment... that's why Crucible Hollow Drill Rods were chosen. For *lowest cost per foot of hole drilled* specify Crucible Hollow Drill Rods.

Crucible Hollow Drill Steel in machines like this one bite into ore on Cerro Bolivar.

One of the men who helped make the project possible — C. Dugan Graham, vice-president of M-K de Venezuela, and project manager in charge of the job.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking

HOLLOW DRILL ROD

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

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Its a Real ROCK Pullshovel Too!

Sure! You can handle a lot of jobs with a light pullshovel rig but what do you do when you get up against digging like this? Here is one of the places where you need the rugged, heavy-duty construction characteristic of Northwest design.

Your Northwest Pullshovel is built to help you meet all conditions. It's a *real* Rock Pullshovel and it handles a rugged operation with the minimum of difficulty. And remember! If you have a *real* Rock Pullshovel you're sure of a higher output than with the ordinary rig when the trench cuts like cheese. Buy for the toughest job you expect to hit! Ask for the full story on a Northwest.

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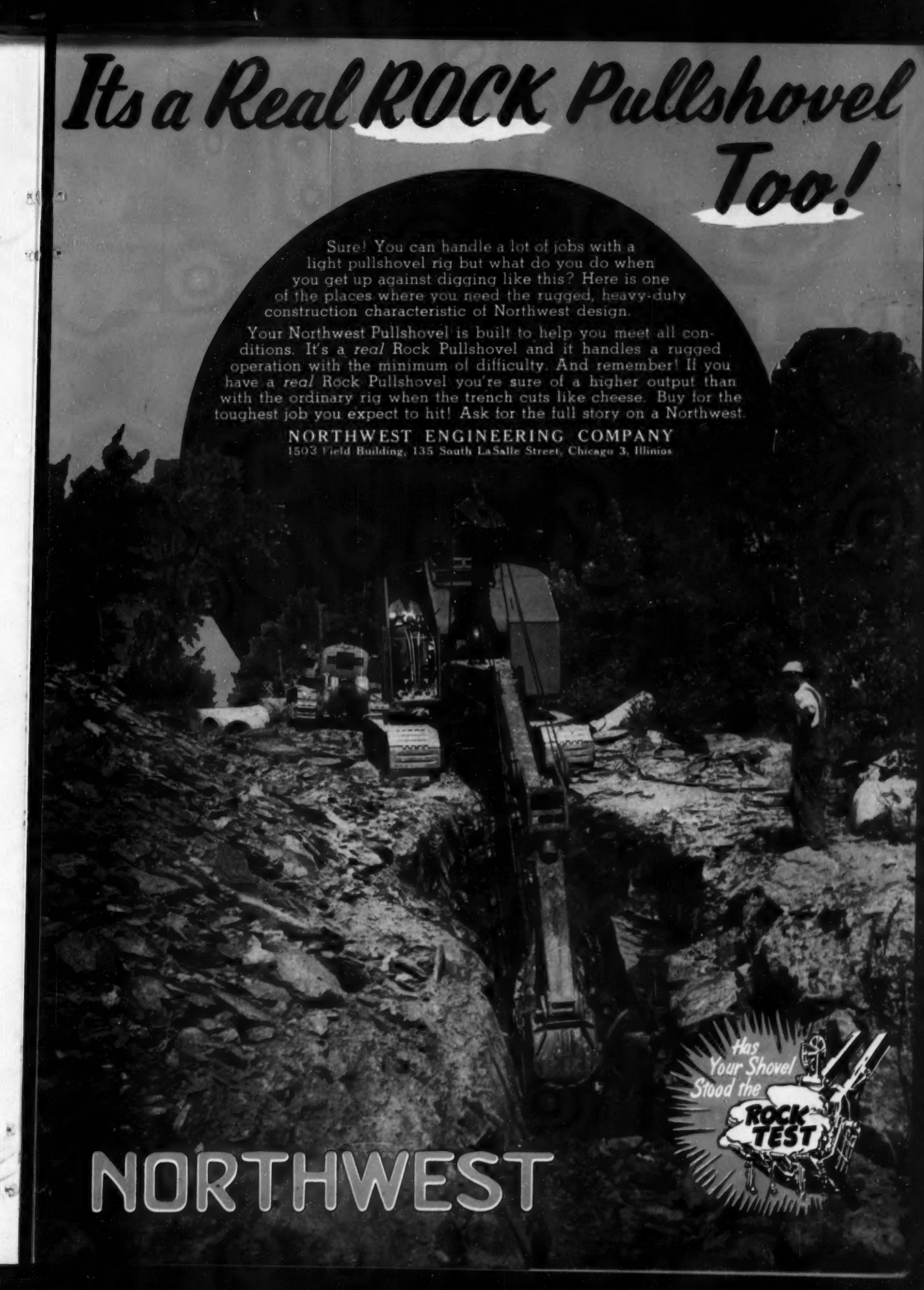


NORTHWEST

ON THE OHIO TURNPIKE...

It's "Eucs" 4 to 1!

438 "EUCS" SPEED GRADING WORK

From the Pennsylvania border to the Indiana line, 261 miles to the west, Euclid equipment is maintaining a fast pace on the 326 million dollar Ohio Turnpike. "Euc" Scrapers, Bottom-Dumps, Loaders and Rear-Dumps were first choice all the way—they outnumber all competitive rubber-tired earth moving equipment by better than 4 to 1!

There's good reason for this overwhelming preference by all of these leading contractors. They know from experience that they can depend on "Eucs" to get more work done on schedule—with little or no down time for repairs. Mighty important, too, is the ability of "Eucs" to take the toughest jobs in stride and move more payloads.

If you can't visit this big Ohio "Road Show" to see the wide range of work being done by "Eucs," have your nearby Euclid distributor give you helpful facts and figures on the complete line of Euclid equipment.

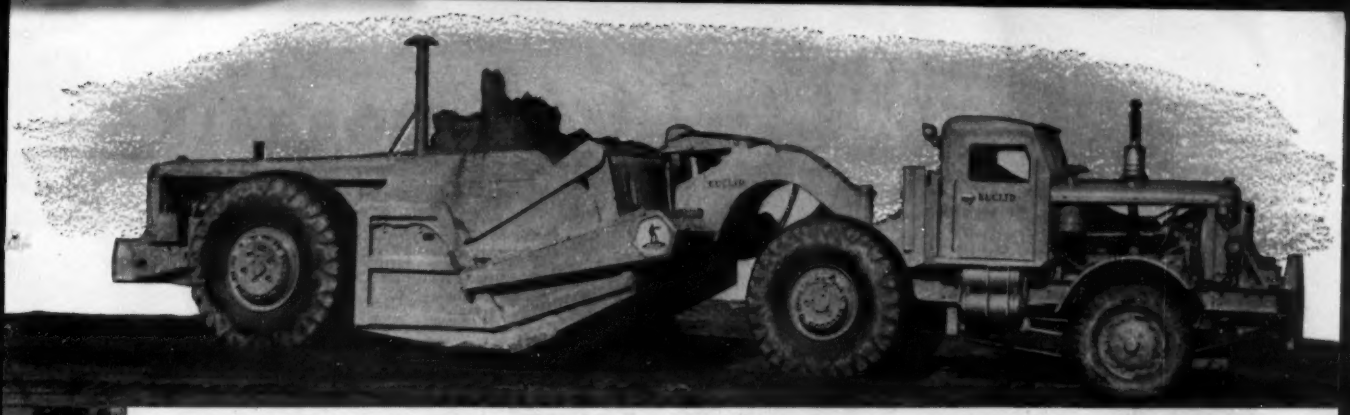
EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Cable address: YUKLID Code: BENTLEY

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS



78 "EUC" SCRAPERS
are a Feature of this Road Show

Euclid scrapers—78 of them—are maintaining a fast pace for 14 of the contractors on the Ohio Turnpike. Big Twin-Power "Eucs" of 18 cu. yd. struck capacity and 15.5 cu. yd. scrapers are making dirt fly all along the way. Fast travel speed, ability to get heaped loads in practically any material, and unsurpassed job availability make Euclid scrapers the logical choice of rubber-tired earth moving equipment for these grading contracts.

Simple, rugged design and easy accessibility for servicing keeps down time to a minimum. Because "Eucs" stay on the job week after week . . . they are helping to keep the grading on schedule in spite of the wettest spring in years.

Fleets of Euclid Bottom-Dumps, working under shovels, draglines and "Euc" Loaders are paying off in high production and low cost yardage, too. As of early May there are 20 Loaders and 306 Bottom-Dumps currently at work on the project . . . 34 Rear-Dumps complete the Euclid Equipment . . . and there'll be more as the big job rolls into high gear!

Whether you're working on roads, airports, dams or other heavy earth moving, you can depend on "Eucs" to move more yards profitably. Get in touch with your Euclid distributor for information on the complete line of Euclid earth moving equipment—he's a good man to know!

"EUCS" move more yards per day
with less down time and maintenance costs

MINUTE MAN of MOVING MIRACLES

MIRACLE is a strong word but when the operator of this trailer can detach the gooseneck—unload a ponderous shovel and re-attach the gooseneck in as little as 5 minutes it is truly *miraculous*.

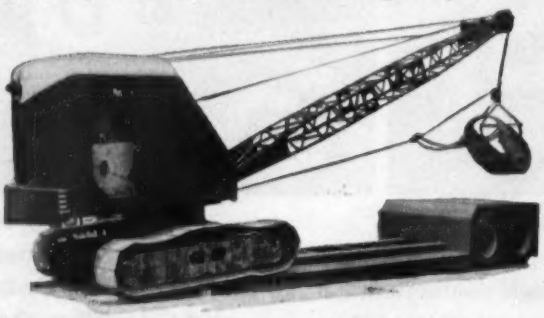
This is being done with the Rogers Power-Lift Detachable Gooseneck Trailers. Moreover, operators can quickly lower the gooseneck for the load to clear low overhead obstructions or raise it to pass over high banked railroads, etc., often avoiding detouring and saving much valuable time.

If you don't have the late Rogers literature, you're not "up" on recent trailer developments. Write for the catalog today.

EXPERIENCE builds 'em

ROGERS HEAVY DUTY

PERFORMANCE sells 'em



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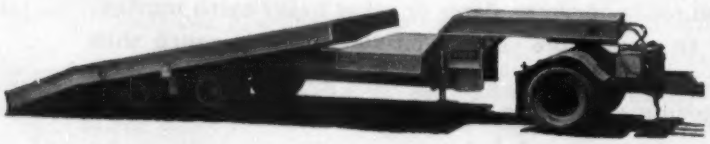
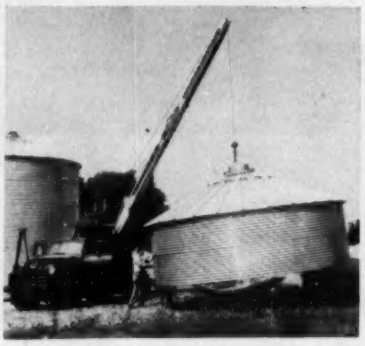


Divided bed, tilt deck trailer with gooseneck.

★ JOB TALK ★

...About Methods



Building From Top Down

Grain storage facilities have been inadequate throughout the Midwest but farmers and government agencies are busy erecting more storage bins—mostly of bolted steel construction. A passing photographer got the picture above.

Workmen assemble the roof plates on the ground. Then the roof is raised with a Bucyrus-Erie Hydrocrane, mounted on a Chevrolet truck, and successive rings of circular wall attached as steel sections are bolted on. The men work comfortably on the ground at all times. Bins are a product of the Butler Manufacturing Co., Kansas City, Mo.

Better Digger

Diesel power rapidly is taking over major power applications in the construction business. This 1¼-yd Lorain 75B shovel, owned by D. M. Bernardi, Inc., Wellesley, Mass., was repowered 18 months

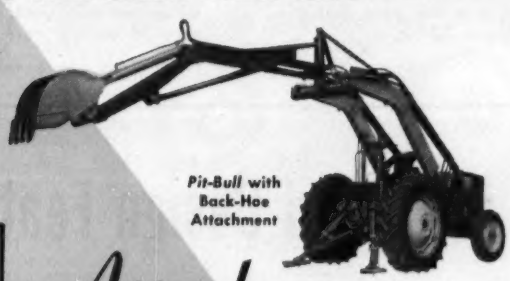
(Continued on page 14)

New! The Davis Pit Bull

Patent Pending

- MOUNTS ON REAR OF FORD OR FERGUSON TRACTORS
- FOUR SPEEDS EACH DIRECTION
- INSTANT REVERSING
- CLEAR VISION... PERFECT CONTROL
- HIGH QUALITY... LESS COST!

Pit-Bull with Loader Attachment



Pit-Bull with Back-Hoe Attachment

11 Attachments... to 1 Basic Unit

Trencher Attachment

Roller Attachment

Rotary Broom Attachment

Dozer Attachment

Swinging Crane Attachment

Fork Lift Attachment

Post Auger Attachment

Hammer Attachment

Rotary Mower Attachment

Model 100 Front End Loader

REPLACES HIGH-INVENTORY EQUIPMENT

Here's the profitable answer to high-cost equipment. It's the Davis ***Pit-Bull***, a top-quality hydraulic basic unit with eleven easy-to-change attachments designed for greater versatility, maneuverability, visibility and performance at only a fraction of the cost of conventional equipment. The ***Pit-Bull*** completely converts your Ford or Ferguson tractor into a powerful industrial unit with all attachments designed and closely coordinated with the basic unit to make changeovers quick and easy. You buy only the attachments you need. Cab is available as extra equipment. A syncro-mesh transmission gives you four speeds in each direction *plus* extra power for digging and loading, and also permits you to change directions instantly without shifting gears. The steering mechanism and seat arrangement, *plus* easy-to-handle control levers, allow the operator to be comfortable and have clear vision with finger-tip control of both the tractor and ***Pit-Bull*** at all times. It's a quality performer with an eye for profit!

MORE JOBS WITH LESS MEN AND MACHINERY

The Davis ***Pit-Bull*** is a payroll saver, too. It's strictly a one-man machine that's always on the go! When it's not digging, it can be loading, trenching, sweeping, or on any of a dozen jobs... the attachments are so easy to change there's little time lost in getting on to another job. Compare ***Pit-Bull***, pound for pound, dollar for dollar; you'll see why it's called the high-quality unit that replaces high-inventory equipment. *Ask for a demonstration.*

The Davis Pit-Bull is manufactured by the makers of the Davis Model 100 Loader, America's quality front-end tractor loader.

SEND THIS COUPON FOR FREE LITERATURE....

MID-WESTERN INDUSTRIES, INC.
1009 S. WEST ST., DEPT. M
WICHITA, KANSAS

Send me literature on the Pit-Bull ☐ I would also like literature on the DAVIS Model 100 Loader to fit a

_____ tractor.

NAME _____

ADDRESS _____

CITY _____ STATE _____ PB-1

MID-WESTERN INDUSTRIES, INC. 1009 SO. WEST STREET WICHITA, KANSAS

QUESTION*

How much more material is there in a Three-Inch-Higher Windrow . . . 9% . . . 18% . . . 31% . . . ?

Cross section of an average, 21-inch high windrow . . . the area (width x height ÷ 2) is 614 sq in.

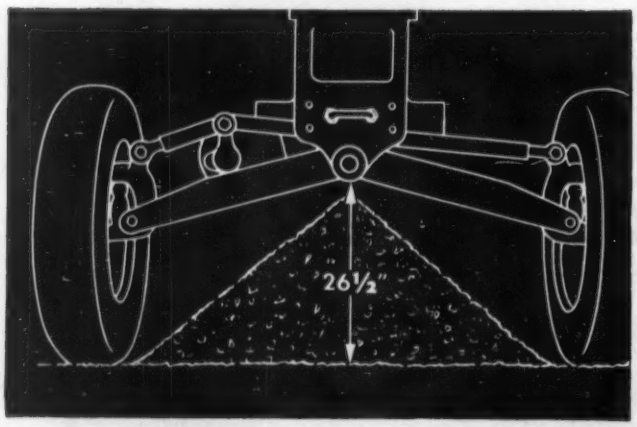
Now increase the height of the windrow by 3 in. The cross-section area now equals 804 sq in.

The difference . . . 190 sq in, over 30 percent more area, which means over 30 *percent more yardage.*

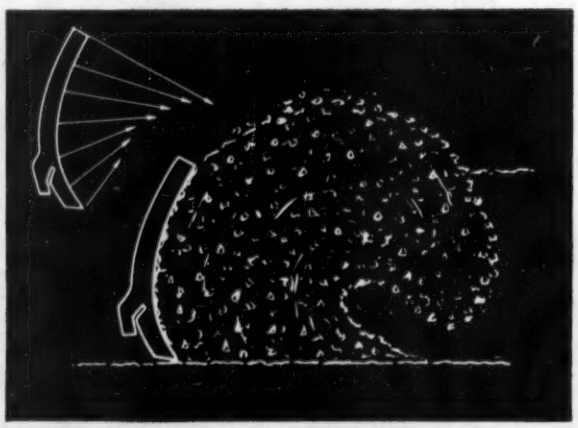
*Only a Combination of Advanced Design Features Lets a Motor Grader Handle Big Loads Fast

To take full advantage of even a *three-inch* difference in windrow height (as explained above) a heavy-duty motor grader needs new design and performance characteristics from front to rear . . . and from the top of the main frame to the bottom of the blade. No single feature can give you the increased work capacity that is so essential on road construction, maintenance and oil-mix jobs.

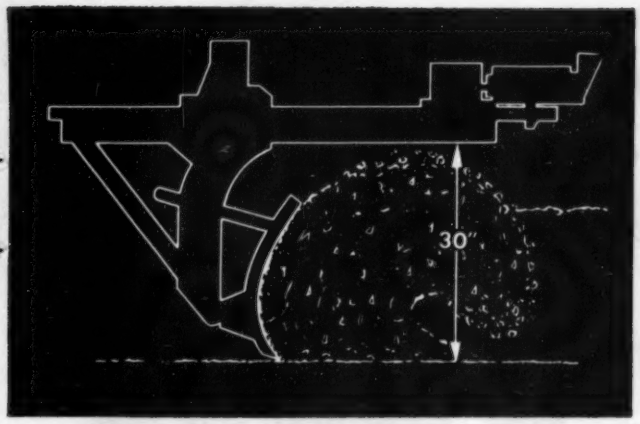
Now let's analyze the Allis-Chalmers 104-brake-horsepower AD-40 to see how it measures up to these stiff requirements.



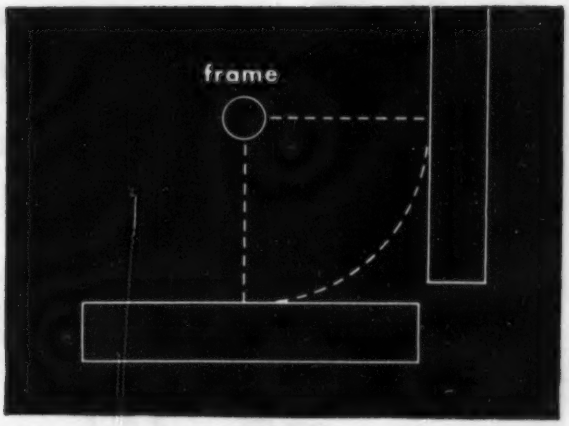
1 **A high-arch front axle** to straddle big windrows . . . take advantage of that 3-inch difference and let big loads pass through to the blade.



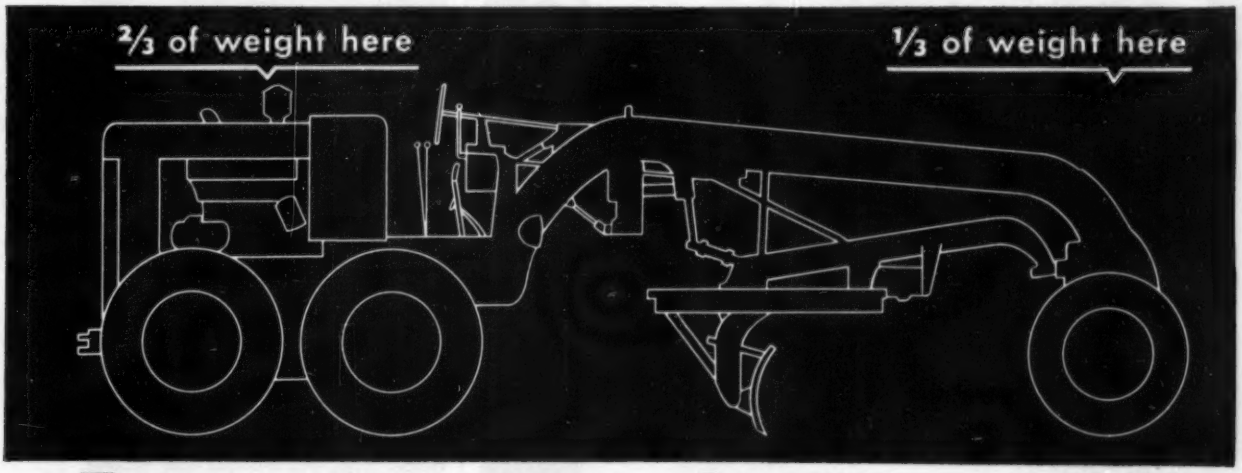
2 **A rolling-action moldboard** . . . to insure a "live" load that rolls freely off the blade . . . moves the load faster and takes full advantage of engine power.



3 **Ample throat clearance** . . . to handle 30 percent bigger loads without disturbing free, rolling action . . . and without jamming dirt, oil-mix or any other material against the circle.

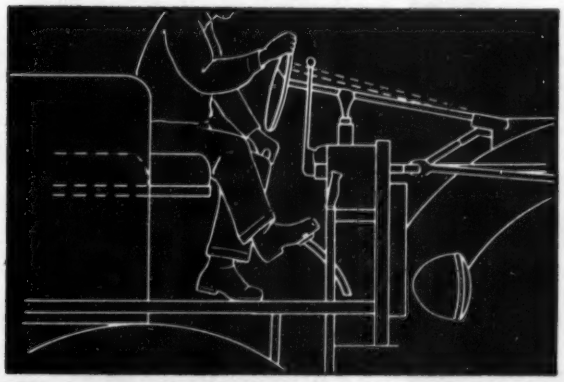


4 **Full blade freedom** . . . the exclusive tubular frame and a long tubular drawbar insure full blading effectiveness on the road, in the ditch or on the slope.



5 **Blading accuracy** is essential. A long wheel base, the tubular frame . . . and lift-cases located directly over the circle, provide smooth, accurate finishing.

6 **Balanced power, weight and traction** . . . a heavy-duty engine and *two-thirds* of the weight concentrated on tandem-drive rear wheels provide the best in traction, positive blade pressure and steer-ability.



7 **Easy control and visibility** — A big platform with plenty of leg room . . . adjustable seat and steering wheel . . . power steering will assure working ease. Single member frame, low control board and tapered platform corners provide "pilot-house" visibility.

This design, that combines working advantages every owner needs and wants, exists in only one motor grader . . . the Allis-Chalmers AD-40. *That's a fact* . . . a fact your Allis-Chalmers dealer will be glad to prove to you. Ask him to show you how the AD-40 gives you the *differences* that mean more work done . . . by a demonstration under on-the-job conditions.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

AD-40 Motor Grader
104 brake hp • Weight — 23,000 lb

SPEED UP HEAVY HAULING

WITH THE

Heavy Duty

KAL-TRUK

Can be loaded by hopper, mixer, ready-mix truck, or by hand.

Central gate for narrow form pouring.

It can be used as a dump truck . . .

. . . with a flat tilting platform (for brick slabs, etc.)

. . . with or without front and side gates.

Versatile

Powerful

Maneuverable

You'll Cut Costs— Wasted Time— Back-Breaking Labor

America's finest construction truck offers 3-wheel maneuverability—its turning radius is only 6½ ft. The Kal-Truk delivers man-killing loads—up to 3,000 lbs. of bulk material—brick, steel, etc. A Kal-Truk is a jack of all trades, built for years of heavy duty service—engineered to help builders cut costs. 14-HP, 2-cyl., air-cooled engine—easily climbs 20 to 30 degree ramps. 3 forward speeds, 1 reverse. Write Dept. CM-5 for information.

KALAMAZOO
MANUFACTURING COMPANY
1827 Reed St. Kalamazoo, Mich., U.S.A.

FOR OVER 71 YEARS SERVING INDUSTRY AND RAILROADS ALL OVER THE WORLD

JOB TALK . . . Continued from page 10

ago with a 150-hp HBI-600 Cummins diesel. In excavation operations as shown, the owner claims that the shovel now makes three passes to every two made with its former gasoline engine and is a good deal faster on the hoist. Fuel consumption also has been decreased.

Workers Figure Uses for Tool

POWDER-ACTUATED TOOLS are recognized as timesavers on many fastening jobs in construction where drive pins or threaded studs are employed. Now Ramset Fasteners, Inc., reports on interesting applications of 10 Ramset powder tools used by the Glenn L. Martin Co., Baltimore, for maintenance and alterations within its huge aircraft plant.

Martin used more than 30,000 pins and studs last year. They speed all sorts of operations, including fastening steel track to concrete floors, staking a wooden security fence to a concrete surface, fastening angle irons to steel beams and installation of fixtures.

Increased working space was obtained inside the plant by constructing balconies in high bays. The 3-in. planking used as a balcony flooring was "nailed down" with 6-in. studs driven with a Ramset Fastener through a 2x4 into the ⅜-in. steel of the supporting H-beams. Martin officials say that as soon as workmen discover how much tedious drilling can be avoided with a powder-actuated tool, they figure out endless uses for it.

(Continued on page 17)

JOY PAVING BREAKER WINS, CROWNED CHAMP

Recent impartial test proves JOY K-81 best breaker

There were no frills to this particular outfit's testing methods. To find the best Paving Breaker, they simply lined up all competing tools and let 'em go to it. In a matter of minutes, this acid test indicated which was superior.

Such a test is Joy's meat. For example, although the K-81 Paving Breaker is listed in the 82 lb. class, it beat all competition in the 85 lb. class, including machines weighing as much as 91 lbs!

The tests showed a clean sweep for Joy. Class for class, Joy Paving Breakers walked away with the ribbons.

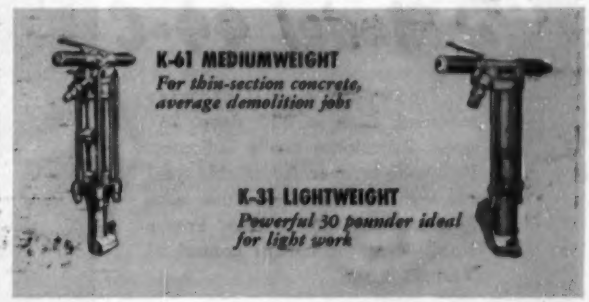
. . . AND NO WONDER JOY BREAKERS ARE TOPS:

Joy Breakers are cadmium-plated *inside and out* to stop rust and corrosion, prevent scoring, speed running-in. Lubrication is automatic—throttle movement sends a shot of oil to all working parts.

Joy Breakers operate with less jarring . . . that means less operator fatigue. There's less maintenance and replacement with Joy. Interchangeability of parts allows a smaller inventory.

Get the full story today. Write for descriptive booklets to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

K-89 SUPER HEAVYWEIGHT
90 lb. model for heavily reinforced concrete sections
K-81 HEAVYWEIGHT
Faster, heavier blows, easier to hold and operate


K-61 MEDIUMWEIGHT
For thin-section concrete, average demolition jobs
K-31 LIGHTWEIGHT
Powerful 30 pounder ideal for light work

DUAL-VALVE MAKES AIR DO MORE WORK!

Permits higher drilling speeds with lower air consumption. Cuts drilling costs.

Consult a Joy Engineer

WAD C6055

JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY

Barber-Greene DITCHERS

DIG IN ANY SOIL . . .
ANY TIME OF YEAR . . .
FOR THE LOWEST COST PER FOOT OF TRENCH

Year-round utility makes B-G Ditchers favorites everywhere. Advanced features include the exclusive Vertical Boom that permits digging right up to walks, foundations, other obstructions, leaving no ramp . . . the milling action of the fast moving, closely spaced buckets that cut through coral, frozen ground, asphalt pavement . . . the overload release that slips when overload occurs, automatically re-sets itself.

ONLY B-G HAS THE

VERTICAL BOOM

BG Model 44-C

Heavy-duty, full crawler mounted. Cuts to 8'3" deep, 24" wide. Adjustable grade indicator. Follow-up scraper. Adjustable spoil conveyor discharges to either side. Replaceable digging teeth. Power boom hoist for instant control of Vertical Boom.

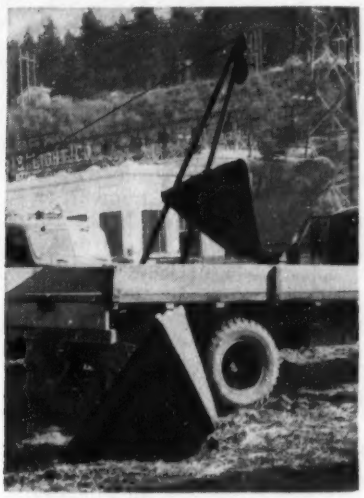
BG Runabout

Model 705B Service Ditcher. Combination of exclusive *Hydra-Crowd* and *Fluid Drive* transmission offers new operating advantages. New, curved, reversible insert teeth last 3 to 5 times longer. Pneumatic tired, travels at 15 m.p.h. One-man operation.

Barber-Greene BG

Aurora, Illinois, U. S. A.

JOB TALK . . . Continued from page 14



Concrete Pyramids Protect Bank

Precast concrete pyramids give economical protection to the banks of a waterway near the White River hydroelectric plant of the Puget Sound Power & Light Co., Seattle.

Rock riprap could have been used, but it would have to be trucked a great distance. The concrete pyramids were cast right at the power plant with transit-mix concrete purchased near by. Each pyramid is 4½ ft square at the base and 4 ft high. Double steel eyes are cast into base and apex for easy handling with a truck-mounted boom.

Thirty pyramids were lowered over the eroding bank into the edge of the swirling stream. Rockfill from a river bar 100 ft downstream will be bulldozed behind the pyramids during low-water periods to give the bank additional support. Cost of the pyramids is estimated at about one-half the cost of rock riprap.

but also significant

Loads like this have to be handled infrequently but when they are encountered they can't be permitted to stop operations.

If it's an Owen Bucket you can handle such unusual, especially difficult loads without fear of damage to the bucket.

Long experience has taught Owen Engineers where to build in the extra strength in additional material or *special* steel to withstand the abuse to which all buckets are subjected occasionally. That's why they render service for uncommonly long periods with remarkably low repair and maintenance expense.

THE OWEN BUCKET CO.

6020 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

It's Your Business . . .

Contractors sign up record $4.6 billion in 1953 nonbuilding contracts

4318 firms taking on $100,000 or more in new business handle 5% more projects for 28% more dollar volume than in 1952

Type of work	This many contractors . . .	% chg. '52-'53	handled this many projects . . .	% chg. '52-'53	for this dollar volume (millions)	% chg. '53-52
All construction	4,318	+ 3	10,540	+ 5	$4,602	+ 28
Waterworks	599	+ 9	975	+23	223	+ 16
Sewerage	819	+ 22	1,275	+29	390	+ 51
Bridges	670	+ 16	[illegible]	+22	679	+107
Streets & roads	2,036	- 2	4,033	- 2	1,639	+ 28
Earthwork, wtrwys.	458	+0.4	652	+ 3	373	- 19
Airports	650	- 17	901	- 22	497	- 19
Unclassified	708	+ 9	919	+17	801	+ 68

CME Business News

Nonbuilding Contractors Had Boom Year in '53

CONTRACTORS had a banner year in '53, signing up the largest dollar volume of new heavy construction business on record. How the 4,106 firms which took on $100,000 or more in nonbuilding contracts during the year shared in the $4.6 billion awarded is shown in the table above.

Business was better than ever in '53 for all types of work except earthwork and waterways and airport construction. The freeze on new federal starts in February '53 affected drastically the volume of contracts in these two categories.

But state and municipal construction set a new high during the year. This is reflected in the sharp increases in contract volume for bridges, up 107%, sewerage, up 51%, and unclassified, up 68% (some of this unclassified work was privately owned). While the number of highway projects dipped 2% below '52, large turnpike and thruway contracts pushed the '53 dollar total up 28% over '52. The record $1.6 billion in highway work handled by contractors doing $100,000 or more new business was shared by 6% fewer firms than the $1.3 billion in '52 projects.

Big Contractors Get Bigger

The 3% rise to a record number of contractors signing up $100,000 or more new business in '53 helps to explain the stiff competition reported from the field.

The analysis of last year's new business indicates that big firms had a competitive advantage. This is because the number of firms signing up $1,000,000 or more in '53 was 5% higher than in '52, compared to a 2% dip in outfits with $500,000-$1,000,000 and a 3% rise in those with $100,000-$500,000. Furthermore, the million-$ contractors racked up 38% more dollar volume of total new business than in '52. By comparison, the smaller firms increased their dollar volume only 3-4%.

The big firms chalked up their largest gains in sewerage, bridges, streets and roads and unclassified contracts. In fact, they were the only size group with more firms and higher dollar volume in streets and roads in '53 than '52. On the other hand, the smaller firms outgained the big outfits in signing up waterworks and earthwork and waterways. They also upped the volume of waterworks, sewerage and bridges, although increases were less than for big firms.

Private Work Sparks Construction Rise

New business continued to forge ahead at a fast clip in May. While the final figure for the month is not yet available as we go to press, heavy construction contracts will set a new record high for the month —with plenty of room to spare. This follows a high level of April awards which were only 1% below the record for the month set last year.

But because of the slow first quarter, '54 contract volume is off 16% from the all-time high in the '53 period. Commercial building, up 24%, and private mass housing, up 3%, are the only major types of work running ahead of '53 so far. However, highways are only 2% under a year ago, and sewerage construction is only 1% behind.

Declines from '53 in other types of work are: waterworks, 10%; earthwork and waterways, 18%; bridges, 39%; public buildings other than housing, 3%; and industrial buildings, 42%.

While private construction has been the key factor in the surge in contract volume during the last two months, public works volume is beginning to perk up.

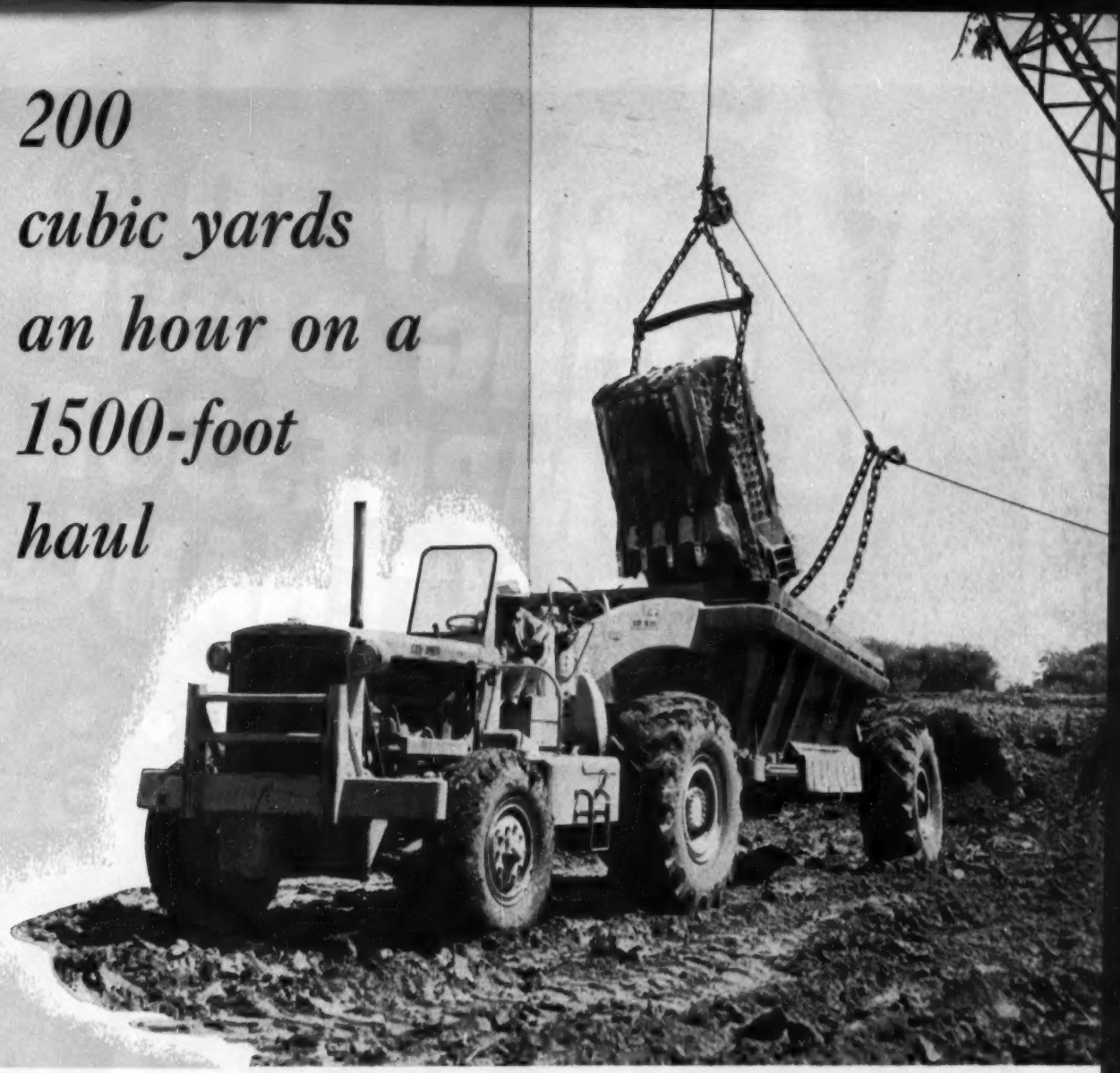
Federal contracts are on the upgrade and should wind up May with the best month in dollar volume since mid-'53. State and municipal construction has been gaining slowly since February and is overdue for a burst of speed . . . so watch for a steeper rise in the months to come.

A big reason for expecting a sharper upturn in state and local public works is that bond sales to finance new projects are setting a record pace this year. In the first 19 weeks of '54, bonds have been sold for $2,013 million to pay for new projects other than public housing. That's a big 52% increase over the '53 period which was the previous high in state and local financing. Turnpikes, toll roads and schools are leading the financing parade so far.

One dark spot in the state and municipal construction outlook appeared this month in the Supreme Court's ruling against segregation in education. This clouds the school construction picture in the South, a region hit harder than any other excepting the Far West by the slow start in new construction business this year. For the first four months

(Continued on page 26)

200 cubic yards an hour on a 1500-foot haul



Cat® DW20 Tractors and W20 Wagons are key units in the earthmoving spread of Geo. Bennett Construction Co., Kansas City, Kansas.

Loaded by the dragline, one of these machines handles 18 cubic yards of material and makes 11 to 12 quarter-mile round trips to the fill per hour. On a construction job near Turner, Kansas, three DW20-W20 units moved 25,584 yards of earth in five working days.

The Bennett Co. also has Caterpillar DW21s, D8s, D7s and Scrapers in its big yellow fleet. Mr. Bennett says: "I have been using Cat machines since 1920. They've been tough and rugged and have held up better than any competitive product I know of."

The fast-moving DW20 Tractor, with its 225-HP Caterpillar Engine, furnishes perfectly matched power for the W20 Wagon. The wagon itself is built to outperform and outlast any other hauling unit in its class. It's engineered for the job, with weight evenly distributed between tractor and wagon tires. Hydraulic ram dumping gives the operator accurate control. And the generous size of the hopper offers a good target for the shovel.

Get actual production figures from your Caterpillar Dealer, nearby for information and service. He'll demonstrate right on your job, where you can compare cycle times with other equipment. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

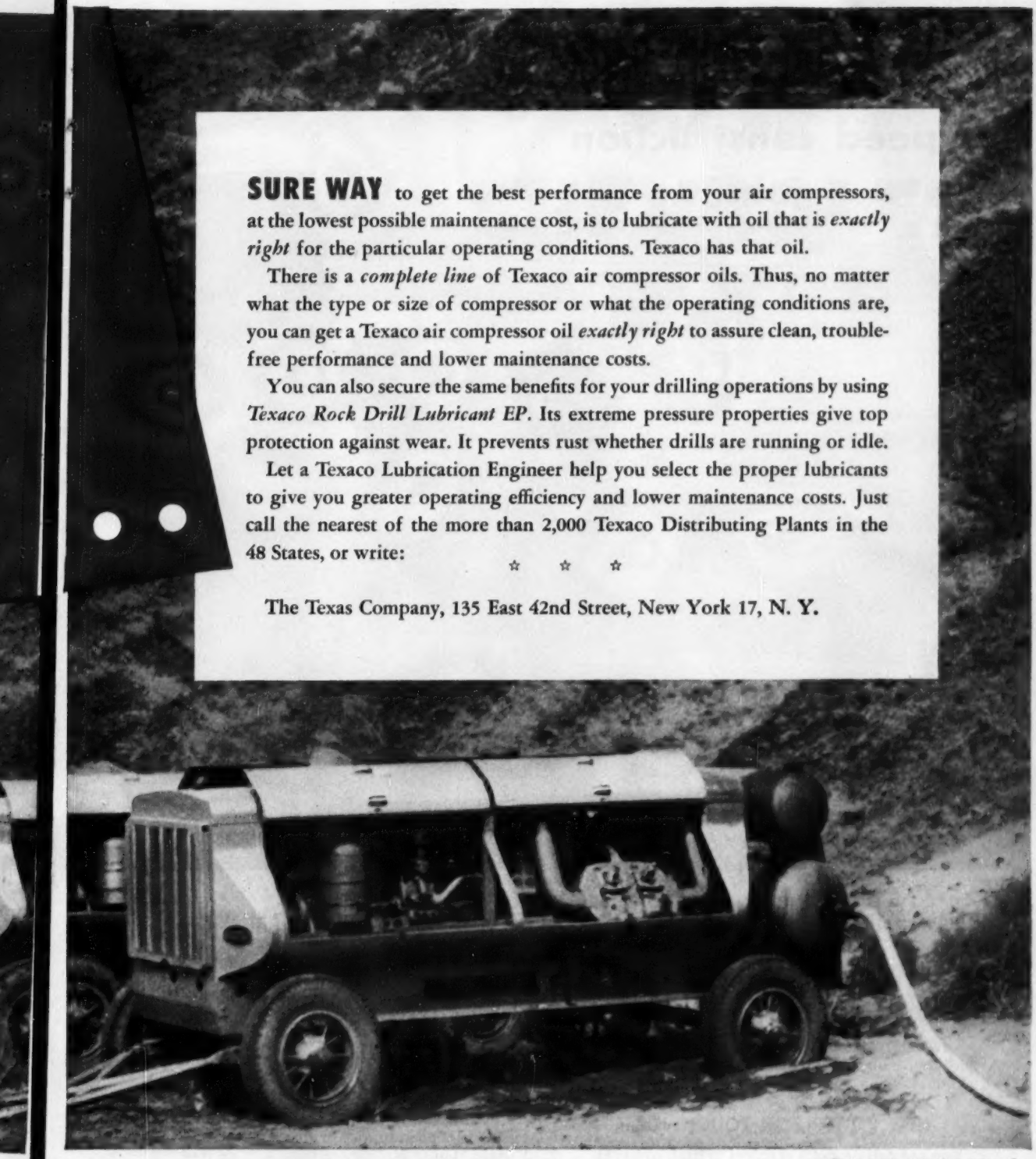
CATERPILLAR®

HOW TO BRING DOWN COMPRESSOR MAINTENANCE COSTS . . .

SIMPLIFIED LUBRICATION PLAN — Handles *all* major lubrication with *no more than six lubricants*. The Texaco Simplified Lubrication Plan saves time, money and mistakes. Ask your Texaco Lubrication Engineer for full details.

TEXACO

TEXACO



SURE WAY to get the best performance from your air compressors, at the lowest possible maintenance cost, is to lubricate with oil that is *exactly right* for the particular operating conditions. Texaco has that oil.

There is a *complete line* of Texaco air compressor oils. Thus, no matter what the type or size of compressor or what the operating conditions are, you can get a Texaco air compressor oil *exactly right* to assure clean, trouble-free performance and lower maintenance costs.

You can also secure the same benefits for your drilling operations by using *Texaco Rock Drill Lubricant EP*. Its extreme pressure properties give top protection against wear. It prevents rust whether drills are running or idle.

Let a Texaco Lubrication Engineer help you select the proper lubricants to give you greater operating efficiency and lower maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

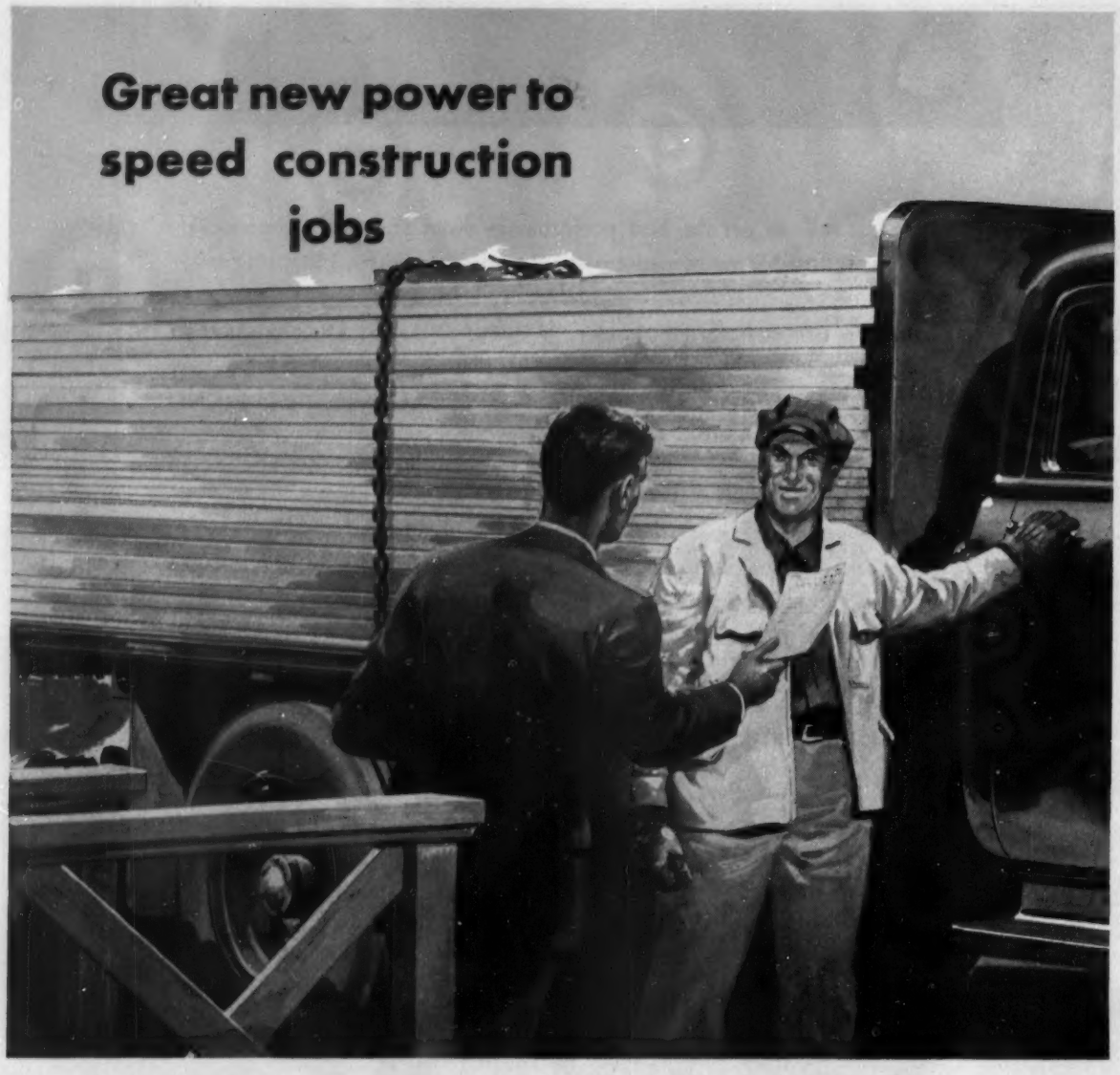
The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Photo courtesy Gardner-Denver Co.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Great new power to speed construction jobs



New 2-tonners with all-new "Jobmaster 261" engine* make light work of heavy hauling . . . save you time every trip

Here's Chevrolet's newest and most powerful answer to your construction hauling needs. New 2-ton Chevrolet trucks have what it takes to speed up your schedules and bring down your costs on big load off-the-road operations.

NEW POWER FOR TOUGH JOBS

You can call on extra reserves of high compression power that takes steep grades and rough terrain in its stride. In fact, the all-new "Jobmaster 261" engine* is the most powerful Chevrolet truck engine ever built. And it delivers increased operating economy besides! That's because it reduces the need for shifting into the low gears on grades and in traffic.

NEW SPACE FOR BIG LOADS

Spacious new Chevrolet stake and platform bodies permit you to haul wider, longer loads. New Chevrolet pickups also bring you increased load space. These bodies are built to take it—and keep coming back for more!

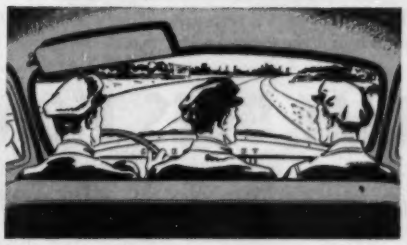
Why not stop in and get the whole money-saving Chevrolet truck story at your Chevrolet dealer's soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCKS

NEW CHEVROLET TRUCKS

New, stronger rear axle

Larger axle shafts in 2-ton models provide increased durability that pays off on construction jobs.



New Comfortmaster cab

New one-piece curved windshield increases visibility. New instrument panel is easier to read and reach.

MOST TRUSTWORTHY TRUCKS ON ANY JOB!

Plus all these Advance-Design truck features: THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra-heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. SYNCHRO-MESH TRANSMISSION—DIAPHRAGM SPRING CLUTCH—HYPOID REAR AXLE—TWIN-ACTION REAR WHEEL BRAKES on heavy-duty models. DUAL-SHOE PARKING BRAKE on heavy-duty models. NEW RIDE CONTROL SEAT*—NEW, ROOMIER PICKUP, STAKE AND PLATFORM BODIES—NEW COMFORTMASTER CAB—PANORAMIC WINDSHIELD—BALL GEAR STEERING—NEW ADVANCE-DESIGN STYLING.

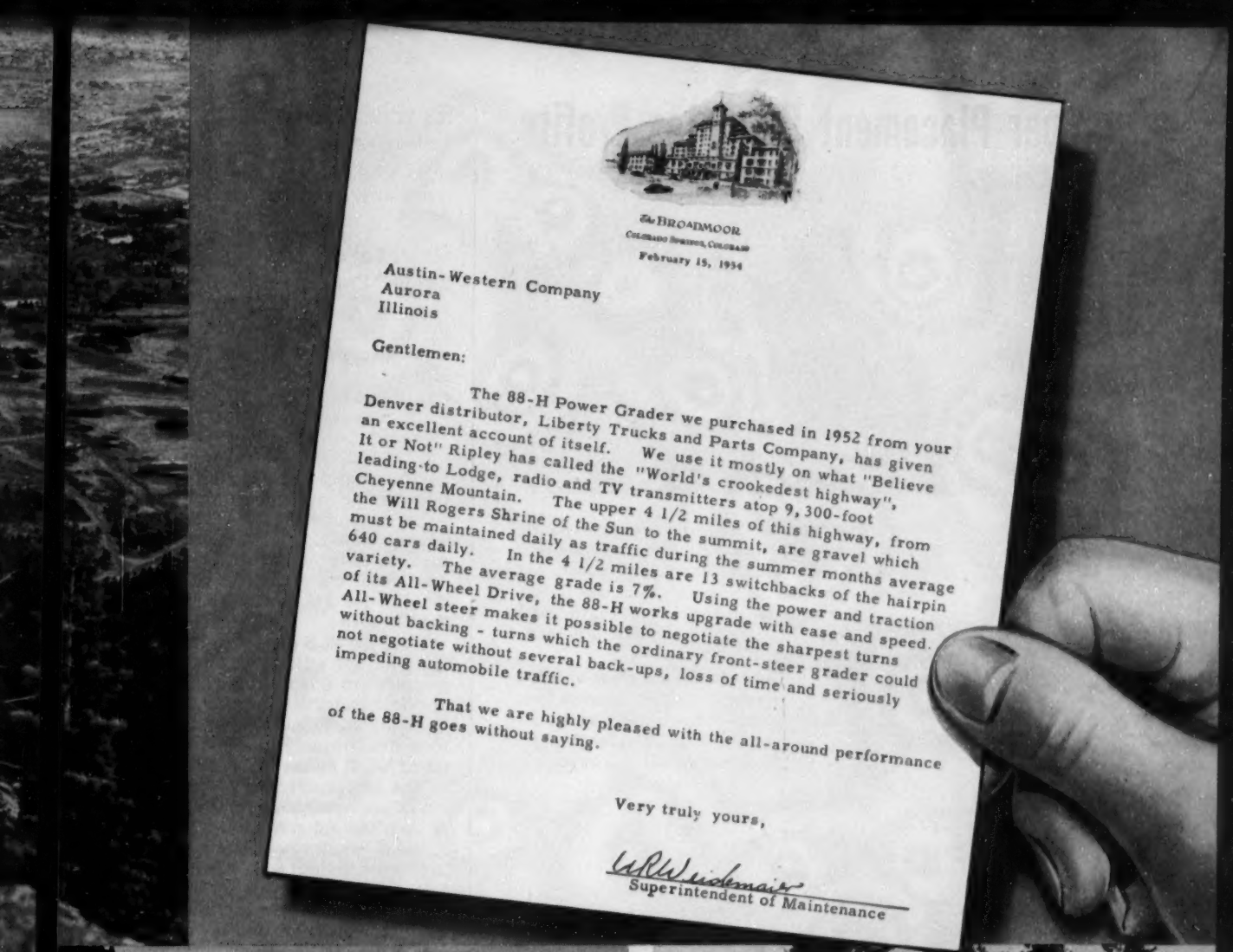
**Optional at extra cost. Ride Control Seat is available in standard cabs only, "Jobmaster 261" engine on 2-ton models.*

Lying directly at the foot of towering Cheyenne Mountain, the Broadmoor with its private golf course, lake, ice palace and rodeo stadium is one of the famous resort hotels of the world.

THE GRADER THAT GOES MOUNTAIN CLIMBING

Grades too steep and curves too sharp for the ordinary rear drive, front steer motor grader are all in a day's work for the Austin-Western Power Grader, thanks to the greatly increased traction and power-at-the-blade of its exclusive All-Wheel Drive, and to the unequalled "turnability" of its exclusive All-Wheel Steer.

To the average owner, not faced with the problem of climbing mountains, ability to *work successfully upgrade* means corresponding ability to *move more material on the level* . . . ability to negotiate mountain curves spells maneuverability that saves time on every job.



The BROADMOOR
COLORADO SPRINGS, COLORADO

February 15, 1954

Austin-Western Company
Aurora
Illinois

Gentlemen:

The 88-H Power Grader we purchased in 1952 from your Denver distributor, Liberty Trucks and Parts Company, has given an excellent account of itself. We use it mostly on what "Believe It or Not" Ripley has called the "World's crookedest highway", leading to Lodge, radio and TV transmitters atop 9,300-foot Cheyenne Mountain. The upper 4 1/2 miles of this highway, from the Will Rogers Shrine of the Sun to the summit, are gravel which must be maintained daily as traffic during the summer months average 640 cars daily. In the 4 1/2 miles are 13 switchbacks of the hairpin variety. The average grade is 7%. Using the power and traction of its All-Wheel Drive, the 88-H works upgrade with ease and speed. All-Wheel steer makes it possible to negotiate the sharpest turns without backing - turns which the ordinary front-steer grader could not negotiate without several back-ups, loss of time and seriously impeding automobile traffic.

That we are highly pleased with the all-around performance of the 88-H goes without saying.

Very truly yours,

W. R. Widemair
Superintendent of Maintenance

Entering the hairpin switchback shown in the long shot at the left, the "88-H" steers front and rear wheels in opposite directions to complete *without backing* a turn that would require several time-consuming backups with a front steer grader of comparable size.

Heavy traffic on the "world's crookedest highway" makes it essential that the gravel surface be maintained in perfect condition every hour of the day. Like all Austin-Western Power Graders, the "88-H" has ample traction for work uphill as well as downhill.

Austin-Western

Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

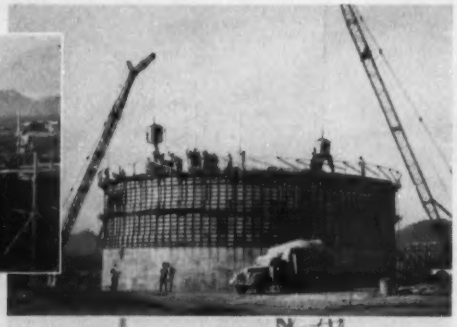
BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Proper Placement Promotes Profits

There are no delays on this job—no waiting for concrete or tie up of crews when the concrete placing job is equipped with a Gar-Bro concrete bucket, floor hopper and concrete carts. They are basic tools of the industry. On this municipal stadium job 420 cu. yds. were placed in 10 hours

When bucket and crane could not reach the center of a reservoir floor, a fleet of Power-carts shuttled the concrete from a Gar-Bro Portable Hopper to the floor slab forms.



Contractor saves money by discarding fixed tremie stations and using movable Gar-Bro elephant trunks to chute concrete deep into wall forms. Gar-Bro 1-yd. buckets and collection hoppers were used.

40 ft. under water, concrete was placed with a special 4 cu. yd. Gar-Bro bucket converted by addition of a crown top. Gate was air-operated by remote control from barge.

Write for 60-page Concrete Handling Manual

Includes useful tables, references, correct and incorrect methods, unusual jobs solved and other data.

EQUIPMENT GAR-BRO ENGINEERING SERVICE

GAR-BRO MANUFACTURING COMPANY
Los Angeles 21, California, 2415 East Washington Boulevard
Peoria, Illinois, 1600 North Adams

IT'S YOUR BUSINESS . . .

Continued from page 18

of '54, total heavy construction contracts were down 37% from the 53' period.

New Yardstick Shows Employment Up

The Bureau of Labor Statistics has just come out with a revised series giving a more optimistic picture of employment in contract construction.

This new series shows April employment climbing seasonally to 2,512,000, up 0.1% over April '53. Furthermore, instead of March employment being slightly lower than a year ago in the old series, the new figures show it was 0.6% higher. Also, January and February averaged about 1% under last year instead of the 2% decline shown by the old series.

What the BLS did was to change the basis for estimating total employment to a more recent period. The effect of this new benchmark is to adjust the old series upward from 1951 through the first quarter of '54. It makes a big difference in the first quarter of '54 figures which are now about 100,000 higher than the old series.

March employment in nonbuilding construction was 439,000 or 2.6% higher than in March '53. The number of workers on highway and street construction was up nearly 9% to 171,800, according to the revised series.

Failures Drop But Squeeze Remains

Contractor failures dropped to 92 in April from the postwar high of 143 in March, according to Dun & Bradstreet. But there is no sign of a further decline in May. In fact, figures for the first two weeks of the month indicate that May failures could go up again.

One of the big reasons for the sharp rise in contractor failures has been the continuing squeeze on contractor prices brought on by hard competition. This squeeze got tighter in the first quarter of '54, as bid prices on highway construction dropped again.

Prices on federally aided highway work averaged 3.1% less in the first quarter of '54 than during the last quarter of '53, according to the Bureau of Public Roads. They were 8.4% lower than the high reached in the first quarter of

(Continued on page 28)

CAT* D397
ELECTRIC SETS
POWER FIVE-YARD SHOVELS ON HARD-ROCK SECTION OF N. Y. THRUWAY

Between Whitesport and Kingston, N.Y., construction of the New York State Thruway requires blasting and excavating through solid rock. George M. Brewster & Son, Inc., subcontractor on this 9.27-mile section, uses two Bucyrus-Erie five-yard electric shovels to load out rock after blasting. And power for each of them is supplied by a Caterpillar Diesel D397 Electric Set that delivers 315 KW. One of the generator units is mounted on skids, the other on a trailer, for easy relocation.

No power line was readily available at this location, thus the cost of running transmission lines would be extremely high. Since the Brewster firm wanted to use its big electric shovels to handle larger rock and save shooting costs, it tried the first shovel and electric set team as an experiment.

The savings have proved well worth while. Fast production is one result, and low-cost electric power is another. The Caterpillar units operate steadily on No. 2 furnace oil without fouling, and they require a minimum of attention. Even in competition with utility power, the readily movable electric sets save the repeated cost of hooking up to a power line each time the shovel changes location.

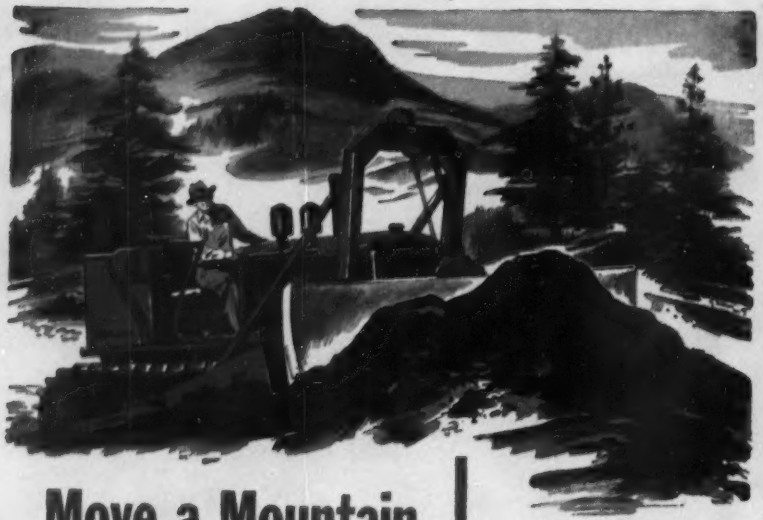
Your Caterpillar Dealer can show you many other advantages of these dependable, trouble-free units. He has 12 sizes of engines and electric sets up to 500 HP and 315 KW, and backs their long, money-saving work life with reliable service and genuine parts. Give him a call today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

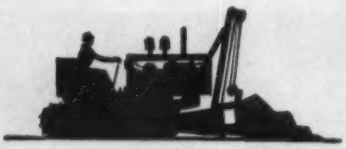
CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

SPECIFY CAT POWER FOR HIGH-PROFIT PERFORMANCE



Move a Mountain



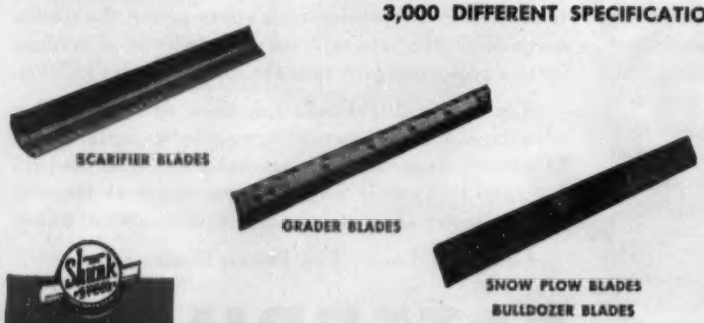
or Push Some Pebbles

Whatever the job, there's a SHUNK blade designed to do it efficiently and economically. For almost a century SHUNK has been manufacturing a full line of fine cutting edges rolled from top-quality steel to fill any maintenance or construction need . . . whether it's gravel, dirt, shale, snow or rocks.

Original equipment manufacturers specify them because of their durability . . . contractors use them because of their dependability . . . distributors like to sell them because they're priced right and deliveries are prompt.

Write us for recommendations on the proper SHUNK blade for *your* job.

3,000 DIFFERENT SPECIFICATIONS



Shunk MANUFACTURING COMPANY

In Our 99th Year

BEST BLADES MADE

BUCYRUS, OHIO

IT'S YOUR BUSINESS . . .

Continued from page 26

'53 and down to the lowest level since the first quarter of '51.

While prices of common excavation dipped about 1% in the first quarter of this year, bid prices for concrete pavement dropped 3.4%, and structures prices declined 4.5% below the final quarter of '53.

Prices dropped more sharply in California where the State Division of Highways reports that bid prices in the first quarter of '54 were 8% below the previous quarter. This was the lowest level of prices since the fourth quarter of 1950.

SOME BIG CONTRACT AWARDS OF THE MONTH

Crane Construction Co., 201 E. Walton St., Chicago 11, Ill. Three apartments in Chicago for the Lake Shore Management Co., 201 E. Walton St., Chicago, Ill. $10,000,000.

United Concrete Pipe Corp., Baldwin Park, Calif. Earthwork, pipelines and structures including 11 pumping plants for the Central Valley project, California, for the U.S. Bureau of Reclamation, Dept. of the Interior, Lindsay, Calif. $2,298,484.

Bechtel Corp., 220 Bush St., San Francisco, Calif. Design and construct catalytic reforming unit at El Segundo Calif., for the Standard Oil Co., 225 Bush St., San Francisco. $15,000,000. Also catalytic reforming plants at Richmond, Calif. for the same company, $15,000,000.

Tecon Corp., Box 206, Wrightstown, N. J., Apron, taxiway and warmup pad extension, widening and straightening runway, McGuire Air Force Base, Wrightstown, N. J., for U.S. Engineers, 121 North Broad St., Philadelphia. $2,644,709.

Becker Construction Co., 7701 W. Blue Mound Road, Milwaukee, Wis. General contract for the third unit of a power plant for the town of Oak Creek, Milwaukee, for the Wisconsin Electric Power Co., 231 W. Michigan St., Milwaukee 3, Wis. $23,600,000.

George M. Brewster & Sons, 275 W. Fort Lee Road, Bogota, N. J. Grading, bridges, paving for Route

(Continued on page 212)

NOTHING LIKE IT

IN THE MINE CAR LOADER FIELD!

NEW GARDNER-DENVER GD10

NEW CONVENIENCE!
Naturally positioned controls . . . quickly and easily moved to either side.

NEW SAFETY!
Low center of gravity . . . high flange wheels . . . for greater stability on the rails.

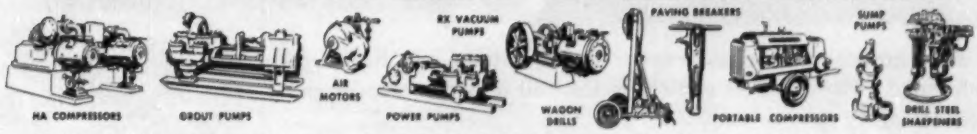
NEW CAPACITY!
One-piece, large-capacity dipper . . . rounded bottom for self-cleaning.

NEW OILING ROUTINE!
Only two points to check . . . both take the same commonly available oil.

NEW FEATURES BY THE DOZEN!
Write for details.

SINCE 1859

GARDNER-DENVER



THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

Minimize
PITTING

Eliminate
PATCHING

Insist on
GLOBE FORM GREASE

The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

Why not write for full particulars today? Once you use Globe Form Grease, you'll understand why engineers and contractors hail it as the "wonder grease" for concrete forms.

OILS *and* GREASES
for every purpose
DIESEL
STEAM
AUTOMOTIVE

Write for descriptive booklet of all Borne, Scrymser products.

BORNE SCRYMSER Since 1874

Our Laboratory Facilities are always at your disposal

BORNE, SCRYMSER COMPANY

ELIZABETH, N. J. • CHARLOTTE, N. C.

How to Judge Value in a Shovel-Crane

You can't compare the quality of two pieces of equipment by simply comparing their so-called "features." For instance, one shovel-crane manufacturer may "sell" the idea that he has a 25 ft. hoe boom as compared with a competitor's 23 ft. boom, leaving the inference that it would dig deeper. Actually, the stick used with the 23 ft. boom might be longer than the one on the 25 ft. boom and, therefore, would dig as deep or deeper. One manufacturer might "feature" antifriction bearings as proof that his machine excelled while actually the high speeds at which he runs his shafts might mean that he couldn't use anything else.

Sometimes highly touted "features" are ballyhoo to cover up inherent weaknesses elsewhere. After all, being *different* isn't necessarily *better*.

Design features cannot just be imposed on a machine — they must be *integrated* into *all* parts and functions. Design features as such are not what users really buy. They buy only what the features will *do* for them in the way of low end cost, ease of use and, primarily, the profits they will produce.

Instead of features, we at Thew believe in what we call "Balanced Quality." We don't claim to "outfeature" every one else; to be faster, more powerful, to have more of "everything." But we do offer "Balanced Quality" in which all the components, and functions, are quality-engineered into a completely integrated unit.

In many respects, we do better than others . . . in others, we come close to the top. But all-in-all, the combination results in a machine in which *quality* has been distributed evenly *throughout* the machine rather than concentrated in a few sales features. A machine in which *power* has been "*balanced*" properly between all operations, in which the *speeds* of various functions have been *balanced* for integrated, synchronized operations, in which the *controls* have been *balanced* to produce quick starts and rapid acceleration, in which the *weight* of the machine has been *balanced* for maximum stability.

Any one of these results in itself, or the design by which it is achieved, may not be sensational but, added all together, they will do that one thing we believe you really want more than anything else — and that is: *put more dirt in the wagons, faster, at lower cost — and to do it longer!*

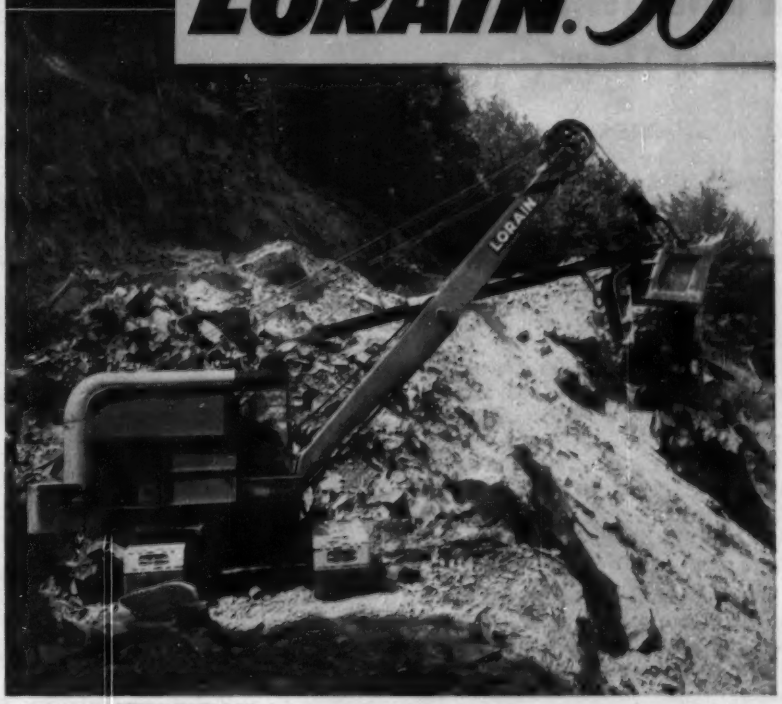
(Advertisement)

WANT "FULL MEASURE" IN A 1-YARD SHOVEL?

Want to be sure of getting the "full measure" of value from your next shovel in the 1-yd. class? Want high output? Low maintenance? More work hours on the job? Then, investigate the values in the Lorain-50! Investigate the many advantages of the Hydraulic (fluid drive) Coupling . . . plus the "balanced quality" *throughout* this stand-out performer in the 1-yd. class. Your nearby Thew-Lorain Distributor can show you how the "50" values measure up in action on the job.

THE THEW SHOVEL CO., LORAIN, OHIO

SEE THE THEW LORAIN "50"



SEND FOR LORAIN "50" CATALOG

See why Lorain design gives you "full measure" of value — get the inside story on this quality-built 1-yd. class machine. Write for your catalog today.

THEW LORAIN

OFFERING MORE THAN 136 SHOVEL-CRANE COMBINATIONS — ON CRAWLERS OR RUBBER-TIRES . . . TO BEST FIT YOUR JOB FOR PROFIT!

SEE YOUR THEW-LORAIN DISTRIBUTOR

"I get these Heaped Loads every cycle!"

Paul Crawley, fast-moving Illinois contractor, tells how he moved 197,700 cubic yards in 13 days.

"It takes more than luck," says Paul Crawley, Edwardsville, Ill., *"when you start a big job three weeks behind schedule—and catch up in two short months!*

"We did it with a team of top operators and mechanics, using the right kind of equipment for the job."

After being held up for 3 weeks by heavy rains, Crawley's fast-moving crew went into action May 1. Soon they were putting a heaped load on the Cahokia Levee every 20 seconds. In one 13-day period, they moved 197,700 cubic yards. By July 1 they had caught up—were actually three days ahead of schedule!

If you have dirt to move, with time and costs to consider, see the man who can help you most—your IH Industrial Distributor. Ask him about rugged, simple INTERNATIONAL "Job-Phased"* equipment that does such an outstanding job for contractors.

Loadin' on the levee for the Cahokia Creek Diversion Channel, near East St. Louis, Ill., one of Paul Crawley's three INTERNATIONAL TD-24 crawlers with INTERNATIONAL B-170A scrapers walks away with a heaped load to help make time on a tight schedule. The excellent flotation of the INTERNATIONAL Scraper, its fast fill, short turning radius, remarkable stability and fast, clean dumps were big factors in Crawley's great record on this job.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

For every move in Earthmoving

ON TRACKS ...ON RUBBER

See INTERNATIONAL'S "Job-Phased"* equipment

INTERNATIONAL HARVESTER

POWER THAT PAYS

INTERNATIONAL

***Phased Equipment**—Machines designed and built to handle each major phase of earthmoving most efficiently and economically.

For every move in earthmoving

INTERNATIONAL Industrial Distributors are your headquarters for the complete INTERNATIONAL line of modern earthmoving equipment, led by the INTERNATIONAL TD-24, world's most powerful crawler, and by the INTERNATIONAL two-wheel, rubber-tired tractors with scrapers and bottom dump wagon.

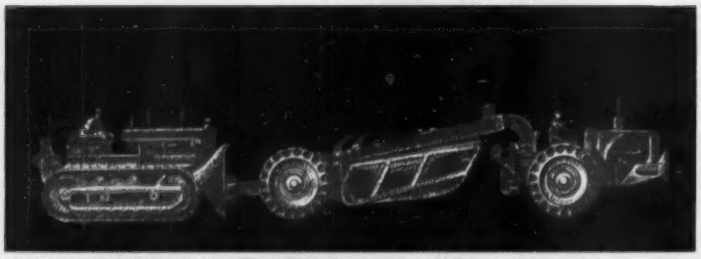
For proof of INTERNATIONAL performance, call your INTERNATIONAL Industrial Distributor today. Get the low-down on low-cost earthmoving on your own job—with a demonstration whenever you say.

MAKES EVERY LOAD A PAYLOAD

INTERNATIONAL HARVESTER

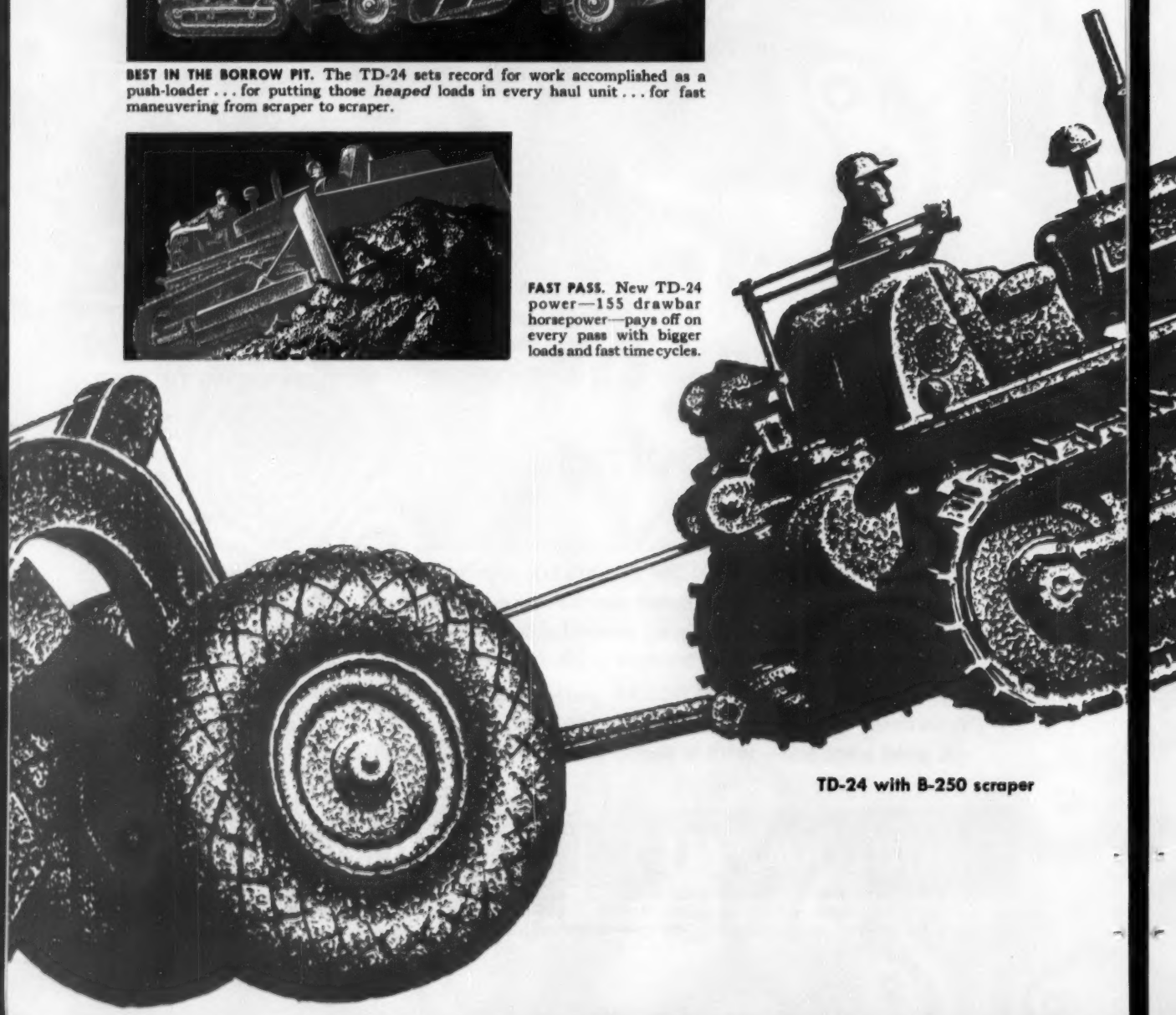
INTERNATIONAL®

The Champ is



BEST IN THE BORROW PIT. The TD-24 sets record for work accomplished as a push-loader . . . for putting those *heaped* loads in every haul unit . . . for fast maneuvering from scraper to scraper.

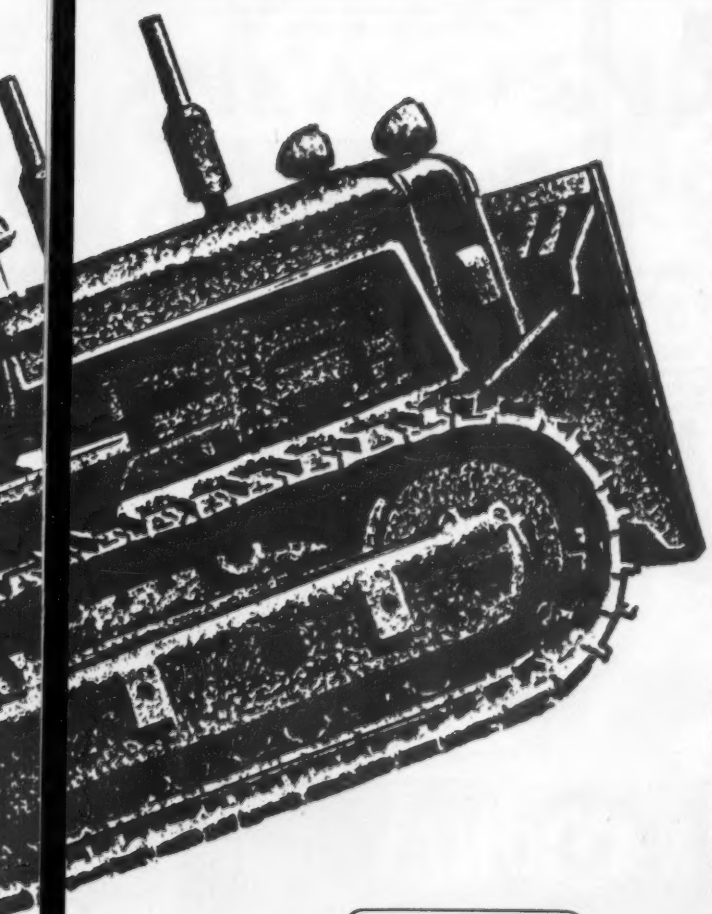
FAST PASS. New TD-24 power—155 drawbar horsepower—pays off on every pass with bigger loads and fast time cycles.



TD-24 with B-250 scraper

Still CHAMP

INTERNATIONAL TD-24 crawler at 155 drawbar horsepower heads a complete equipment line for every move in earthmoving



Now International steps up the power of the most powerful crawler in the world! The TD-24, "The Champ" of crawler power now packs even higher work rating—155 maximum drawbar horsepower.

"The Champ" has been setting performance standards for years with its production-boosting combination of power, speed and stamina. It heads this complete INTERNATIONAL equipment lineup for every move in earthmoving:

- **Seven rugged crawlers, led by the INTERNATIONAL TD-24.**
- **Twenty-two matching hydraulic and cable-controlled bulldozers and BULLGRADER® angling dozers.**
- **Four 4-wheel scrapers.**
- **Two high-speed, two-wheel, rubber-tired tractors with scrapers (13 and 18-yard heaped capacity).**
- **A high-speed, two-wheel, rubber-tired tractor with bottom dump wagon (20-yard heaped capacity).**
- **Five front-end loaders, for the TD-6 through the TD-18A—tops for speedy break-out and loading of all types of materials.**

On tracks—on rubber—INTERNATIONAL power and equipment make the hardest-working work teams in the world.

Call your INTERNATIONAL Industrial Distributor for full details on the *complete* line of INTERNATIONAL earthmoving equipment . . . and for on-*your*-job demonstrations.

INTERNATIONAL HARVESTER

INTERNATIONAL

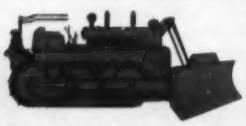
MAKES EVERY LOAD A PAYLOAD

Now All in One Family

the hardest-working work teams in the world!

TD-24 crawler with matched scrapers

TD-18A crawler with matched scrapers



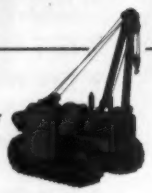
TD-24 crawler with BULLGRADER

TD-14A crawler with cable BULLGRADER

TD-9 crawler with hydraulic bulldozer

TD-9 crawler with front-end loader

TD-6 crawler with hydraulic bulldozer



TD-18A crawler with sideboom

Model 2T-75 two-wheel, rubber-tired tractor with 18-yard heaped capacity scraper

Model 2T-75 two-wheel, rubber-tired tractor with 20-yard heaped capacity bottom dump wagon

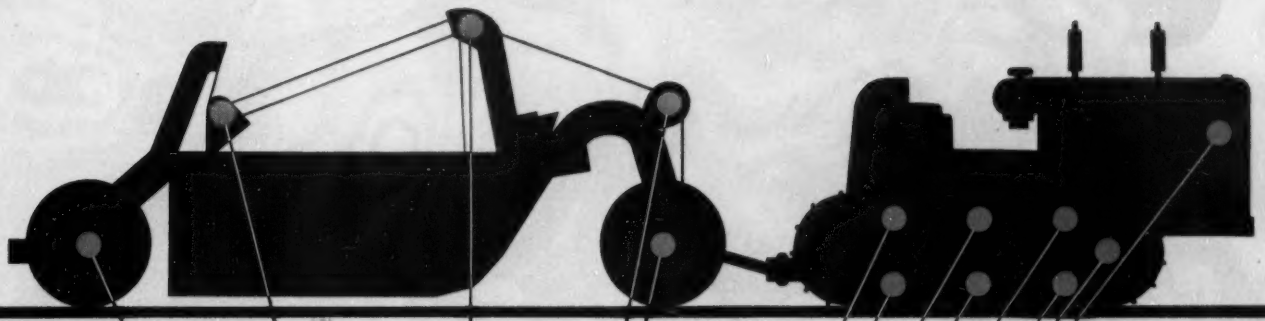
Model 2T-55 two-wheel, rubber-tired tractor with 13-yard heaped capacity scraper

INTERNATIONAL HARVESTER

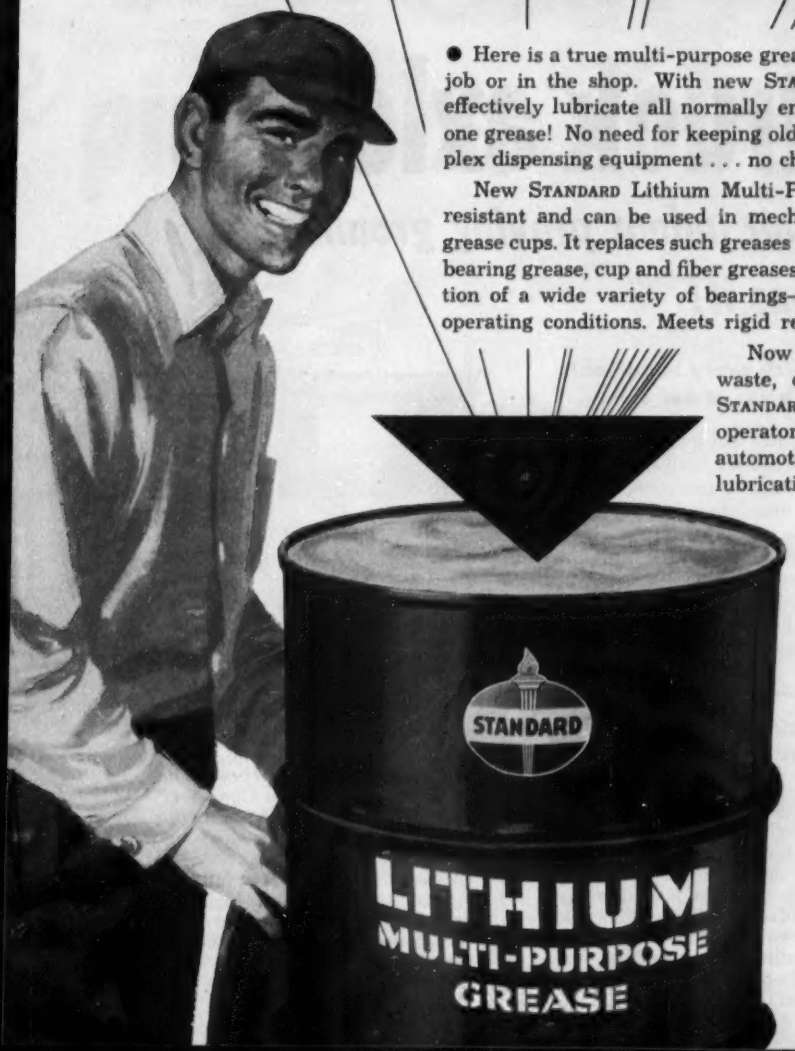
INTERNATIONAL®

MAKES EVERY LOAD A PAYLOAD

now 1 grease replaces 7



NEW STANDARD LITHIUM MULTI-PURPOSE GREASE



● Here is a true multi-purpose grease that can be *used practically anywhere* on the job or in the shop. With new STANDARD Lithium Multi-Purpose Grease you can effectively lubricate all normally encountered grease-lubricated bearings with just one grease! No need for keeping old-fashioned special-grease inventories with complex dispensing equipment . . . no chance of costly application mistakes.

New STANDARD Lithium Multi-Purpose Grease is water and high-temperature resistant and can be used in mechanically and hand-operated dispensers and in grease cups. It replaces such greases as viscous lubricants, water pump grease, wheel-bearing grease, cup and fiber greases and can be used for general chassis and lubrication of a wide variety of bearings—ball, roller, plain, needle—under wet and hot operating conditions. Meets rigid requirements of wheel bearing manufacturers.

Now you can reduce grease inventories, eliminate waste, do away with costly application errors with STANDARD Lithium Multi-Purpose Grease. Ideal for fleet operators, contractors, other large-scale users of heavy automotive equipment. Call your nearby Standard Oil lubrication specialist now.

STANDARD

STANDARD OIL COMPANY *(Indiana)*

We tear truck axles to

in the new Timken-Detroit indoor proving ground

...and only Timken has it!

We smash, twist, jerk and over-load them. Match every imaginable hauling situation. Then add a few ruinous tricks of our own.

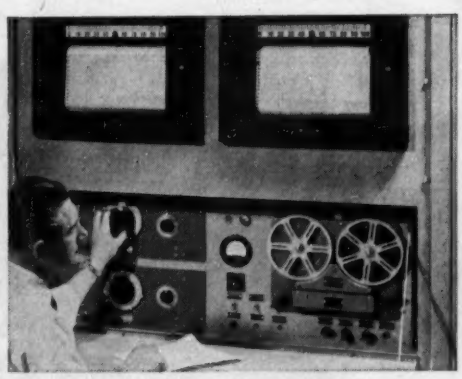
It's done on purpose. So we can tell you in advance that a Timken-Detroit axle can take a more brutal beating on the job it was designed for than any other axle made.

To prove it, we condensed a multi-thousand acre proving ground into one room. In it, our engineers can apply 50 years of experience in building axles for trucks, buses and trailers. Here axles and gearing are subjected *indoors* to any possible *outdoor* hauling condition. Axle performance is measured and analyzed under absolute scientific control!

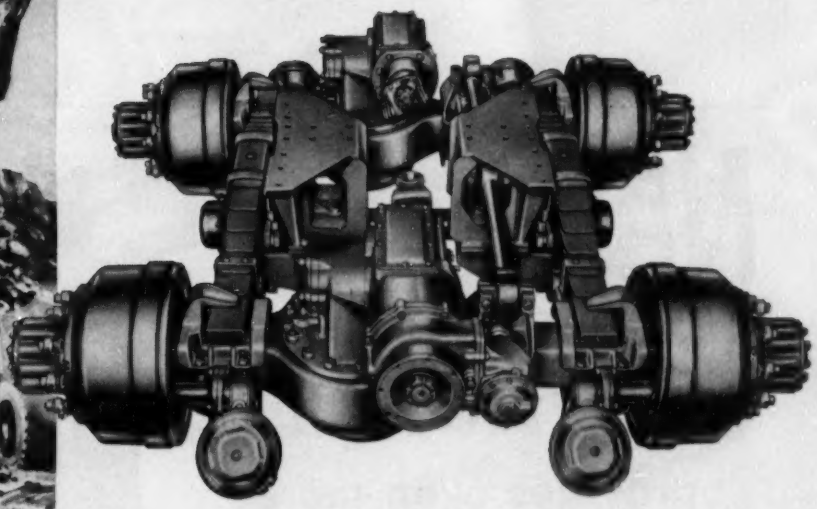
As a result: you enjoy longer axle life; less maintenance, repairs and down-time; lower operating costs; fatter profits. No wonder Timken-Detroit axles are the choice of manufacturers and owners everywhere!

How TDA proves axle quality in this "Torture Chamber."

We take one of our axles and put it on the "block". . . . then duplicate the roughest hauling condition, hour after hour, day after day . . . such as simulating 500,000 miles of toughest driving in just a few days. Or we "dream up" a test like going up hill with a full load at 45 m.p.h. from California to New York—*non-stop*. There is no other axle testing like it in the world!



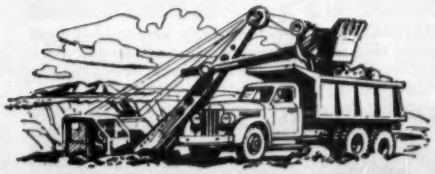
This is our "truck driver," he works in the "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . soft ground at full load . . . mountains . . . express highways or side roads. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!



THREE TYPES: Hypoid-helical double-reduction, optional inter-axle differential. Worm drive, without inter-axle differential.

Soft ground? Heavy load—all up-grade? That's a tremendous strain on an axle. But it's nothing compared to what we do in the indoor proving ground! For instance—we take an axle shaft and twist it 14° forward and backward, 36 times a minute, 24 hours a day, week after week. And that's only one test to give you low-cost performance, long axle life regardless of your hauling conditions.

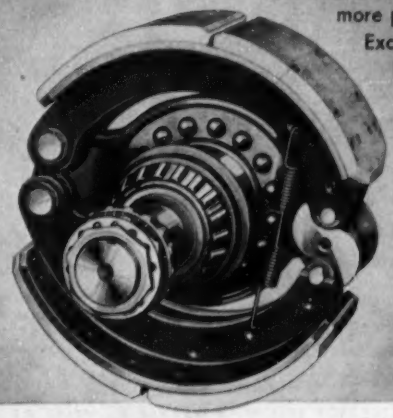
pieces



For six-wheelers . . . the TDA Tandem Drive Rear Axle Unit

Now—the *lightest weight* tandem drive rear axle unit for heavy-duty motor trucks! And with these features, developed, introduced and pioneered by TDA: (1) Available in 3 types of final drives and 3 capacities. (2) Top-mounted straight-line final drive eliminates propeller shaft angularity. (3) Optional inter-axle differential . . . spur gear design, cab-controlled power-lockout. (4) Torsion flow axle shafts . . . guaranteed for 100,000 miles or three years, whichever occurs first. (5) Hot forged steel axle housing . . . guaranteed for the life of the vehicle. (6) Unit-mounted "P" series power brakes . . . for longer life, greater economy and efficiency. (7) Cradle ride spring suspension and paralleled torque rod system . . . maintain correct alignment and weight distribution regardless of driving and braking conditions. (8) Exclusive two-piece trunnion tube bracket speeds servicing. (9) Removable torque rod and spring guide brackets . . . for positive alignment, easier replacement. (10) Rubber torque rod bushings and rubber spring seat bushings . . . eliminate metal-to-metal contact. Require no lubrication.

New TDA brake shoes save up to 40 lbs. per axle



• Lightweight, pressed steel construction to give you more payload plus long wear and safety. Exclusive ¾" TDA "Econoliner" brake liners held rigidly by 12 deep-set rivets per block—*not bolts*. Liners are thickest at center where greatest wear occurs—taper down at ends. Result—longer wear, greater stopping ability. New cam roller mountings never seize or brinnel. Light nylon camshaft bearings wear up to 4 times as long! It's America's new brake shoe!

TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted TDA Standard
TRADE MARK REGISTERED

"TORTURE-TESTED"
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

NEW
CRAWLER-MOUNTED
GRADALL
provides even more Gradall flexibility

THIS RUGGED NEW crawler-mounted model extends the Gradall's cost-cutting action to many new jobs—work in swampy areas where greater flotation is required, in terrain too rough for rubber-mounted equipment, or work in the confines of buildings, ship holds and other close quarters. It's ideal for industrial yard work and materials handling.

The standard crawler with 18" shoes gives this new Gradall a broad, stable working base with low bearing pressure. Wide and extra wide crawlers are also available with 24", 30" and 48" crawler shoes. The crawler turns in an extremely small radius—and its low ground clearance also permits digging to a full 11 feet—deeper with extensions.

This new Gradall also features one-man operation. A single engine powers a hydraulic drive system that both controls the telescoping boom and powers the tracks. Only two brake levers for the tracks have been added to standard Gradall controls for the machine's operation.

Contact your nearest Gradall Distributor for full details on this new crawler-mounted Gradall. Or, see him for a Gradall field demonstration.

Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

Gradall Distributors in over 75 principal cities in the United States and Canada

ONE-MAN OPERATION, maneuverability in tight quarters and good flotation are outstanding features of the crawler-mounted Gradall. Here the machine excavates for a culvert across a new road, leaving the site ready for concrete forms.

GRADALL CLEANS slag pit under open hearth furnace. Its arm-action boom reaches in to work at any angle, to rip and load slag—without damaging supporting brick. Machine works in extremely small quarters.

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

(Advertisement)

PERFORMANCE:

"If you think your rigs can match our Drott's– *bring 'em around!"*

Says N. S. Purtee, Genoa Construction Co., Genoa, Ohio. "We bought our first Drott Skid-Shovel last year, and in nine months we dug out and loaded over 140,000 tons of road screenings and farmed 300 acres to boot. We worked it continuously — up to 16 hours a day — and were so amazed at its performance, that we just bought another Drott Skid-Shovel. When anyone mentions competitive equipment, we tell him to bring it around and try to keep up with our Drotts."

We know that contractors like Mr. Purtee are wise buyers. They examine the facts — compare features and choose the best value. Drott's many patented and exclusive features make the Skid-Shovel so rugged . . . so versatile . . . so productive, that owners keep them busy on profit making jobs all year 'round.

Examine the facts . . . and you'll be amazed at the many "extras" Drott gives you. For instance, pry-over-shoe Break-Out Action, exclusive with Drott, exerts a tremendous digging force (up to 13 tons) without straining the tractor. The Hydro-Spring, exclusive with Drott, reduces destructive hydraulic shocks to less than ⅓ of their original force, thereby saving the loader, tractor and operator. Shoe transportation, with bucket roll back at ground level, exclusive with Drott, enables the Skid-Shovel to semi-skid its load on the ground and to travel over rough terrain without losing the load — this feature combines excellent balance with 360° visibility.

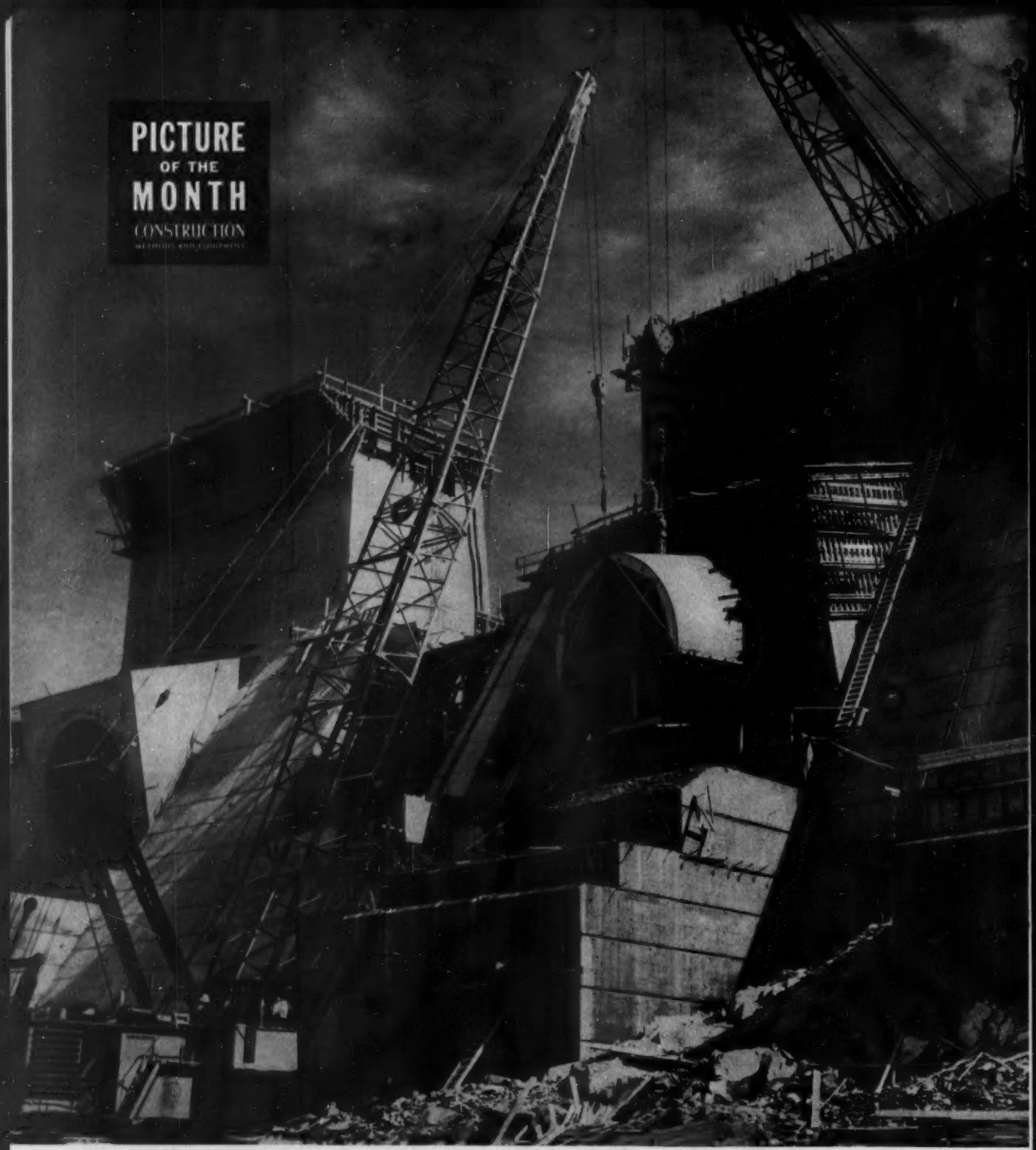
Shown here, left to right, are N. S. Purtee, Bassette Sheldon, and Robert Strohscher, of the Genoa Construction Co., Genoa, Ohio, who report that their Drott Skid-Shovels load out an average of 1,850 tons per machine in a 10 hour day. In a tough, driving business where only performance pays off, these experienced operators say — "No other loader can compare with our Drott."

Drott Skid-Shovels are designed exclusively for International TD6, TD9, TD14A and TD18A crawler tractors. For a demonstration, contact your International Distributor today! For complete details, write for catalog 108.

DROTT MANUFACTURING CORPORATION
Milwaukee 8, Wisconsin

Here two DROTT SKID-SHOVELS are at the job of removing 100,000 tons of waste limestone from a U. S. Gypsum Co. plant. It is loaded into trucks and transported to an expressway site where it is used as a subbase. Note the exclusive bucket roll back action at ground level — exerting a tremendous digging force more than the weight of the tractor.

DROTT SKID-SHOVELS also have higher lift and greater reach than any other comparable equipment. Equipped with patented Hydro-Spring, an exclusive shock absorber on Drott equipment, destructive shocks are reduced to less than ⅓ of their original force, thereby saving strain on the tractor, loader and operator.



Big Form on Way Out

INVERTED V-SHAPED STEEL FORM for the upper half of a penstock opening in the intake structure for Chief Joseph Dam's power plant on the Columbia River is eased out of completed hole for reuse. Manitowoc 4500 Speedcrane, with 140-ft boom, makes the pull, and larger crane boom swings over from behind to give an assist. Arch-shaped 25-ton form will be used to construct a total of 27 such openings. When in place, hydraulic jacks open it to proper curvature—are released when concrete has set. Columbia River Constructors are the builders. Read the full story elsewhere in this issue.

Simplified Concrete Forming System

for Lowest all around Form Costs!

3 BASIC ELEMENTS

UNI-FORM Panels

Prefabricated . . . ready to use when they reach your job.

UNI-FORM Tie

Locks, spreads and ties . . . absolutely accurate.

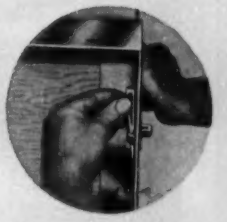
UNI-FORM Tie Key

Wedge-Shaped for fast, easy insertion.

3 SIMPLE OPERATIONS

1 Place the Uni-Form Tie Loop into the Tie Hole.

2 Set the Tie Key into the Tie Loop. Panel and Tie are then locked into one integral unit.



3 Bring the next UNI-FORM Panel into position . . . insert the Tie Key. The assembly is now completed.

UNI-FORM® Panels Assure Faster Erection . . . Automatic Accuracy

ALIGNMENT ON 1 SIDE ONLY!

FREE Engineering Service!

Complete job analysis . . . forming recommendations, bills of material supplied by our staff of experienced engineers . . . **PLUS** . . . Field Service . . . anywhere . . . anytime to insure proper starts and maximum economy on your job. Send us a set of plans for FREE estimate. No obligation.

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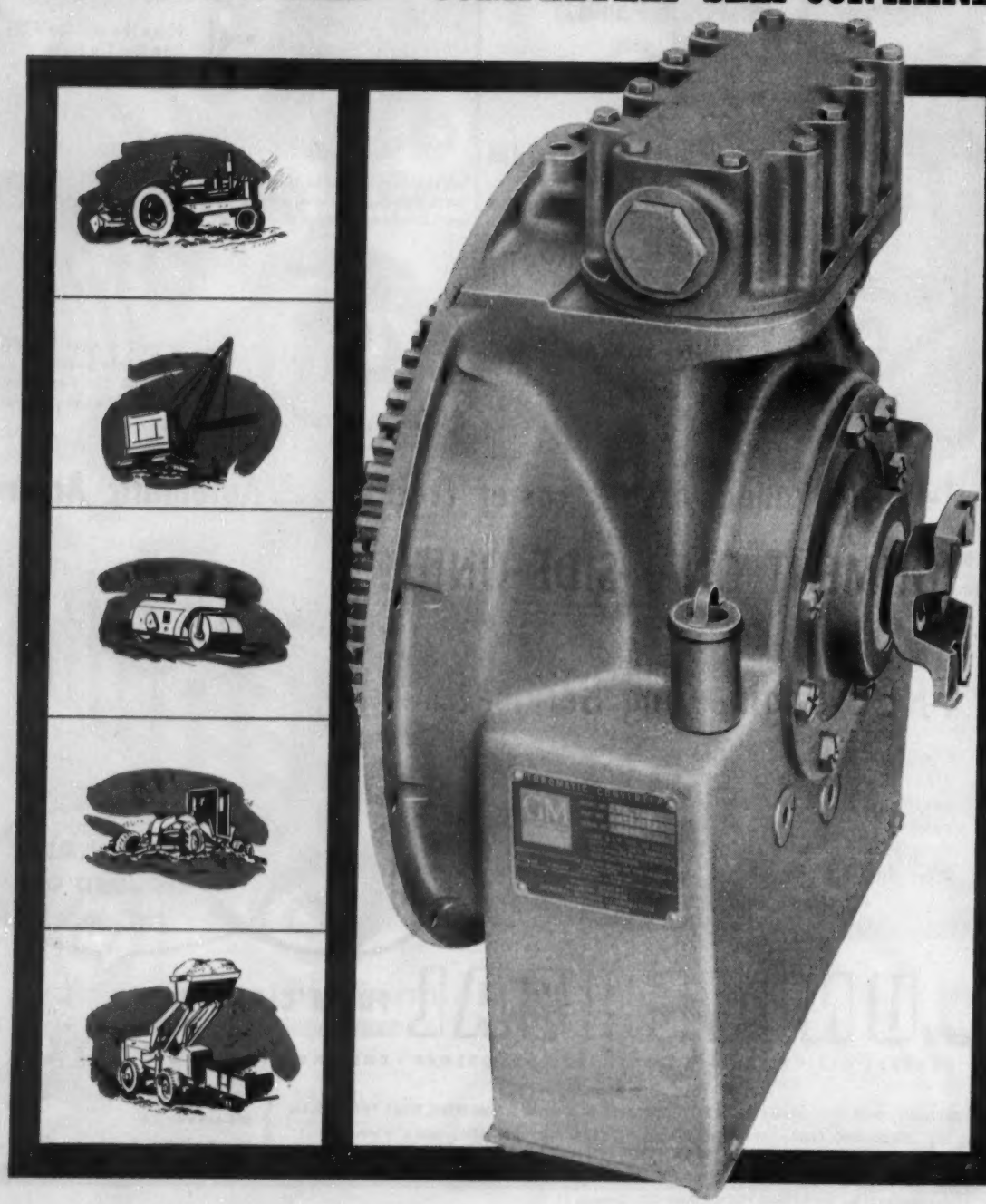

VY-DUTY TORQMATIC CONVERTERS

For 40-150 HP Gasoline- or Diesel-Powered Equipment

HERE, for the first time, are Allison TORQMATIC Converters designed for hard-working gasoline- or Diesel-powered equipment in the medium horsepower range.

These new torque converters are true heavy-duty units *priced to compete* with converters designed primarily for passenger cars—*priced to sell for less* than most comparable industrial-type converters.

And they fit your equipment with little or no change in your design.

Easy installation

New Allison TORQMATIC Converters are completely self-contained for simplified flexible installation—feature integral oil system including charging pump, oil cooler and oil sump. No outside oil lines required. Integral gear drive for easy mounting.

Standard SAE #3 mounting dimensions and conventional internal-external drive gear like that used in ordinary clutch power take-offs simplify installation.

Three different models give you a wide selection of torque ratio and capacity.

Options include front disconnect clutch and adapter, rear disconnect clutch adapter, standard flange as shown, industrial shaft with or without governor drive and oil cooler.

Why use a torque converter?

Your equipment lasts longer with an Allison TORQMATIC Converter transmitting power because it protects engines and driven equipment from harmful shock loads—one of the main causes of equipment breakdowns.

And you get more work from your units, too. New Allison TORQMATIC Converters multiply engine torque up to 3½ times and also provide more production because they broaden your engine's effective horsepower range. When torque output equals load demand the TORQMATIC Converter acts as a fluid coupling to conserve fuel and boost engine life.

Ask your engine or equipment manufacturer about Allison TORQMATIC Converters for your hard-working 40- to 150-horsepower units or mail the coupon.

GM GENERAL MOTORS

Allison

TORQMATIC DRIVES

Allison Division of General Motors
Box 894T, Indianapolis 6, Ind.

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IT'S HERE! The new LINK-BELT SPEEDER LS-98

FULL 1-YARD SHOVEL-CRANE

with Speed-o-Matic® power hydraulic control!

Now, for the first time in the heavy duty 1-yd class, you can buy a machine combining unsurpassed productive capacity and maneuverability with practical transportability. In fact, an LS-98 with Speed-o-Matic control gives you the greatest productive capacity of any shovel-crane conveniently transportable over most state highways.

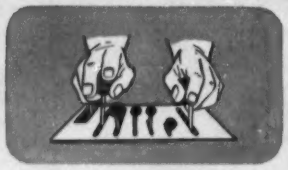
Two years of rugged field testing proved the LS-98 outstanding from both productive and service cost standpoints. It's an ideal machine for widely scattered operations as well as for big production jobs. Fully convertible, the LS-98 is your answer to handling more work at less cost.

Ask your distributor or write for the 98 Series catalog and the booklet on Speed-o-Matic control.

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa 13,490-A

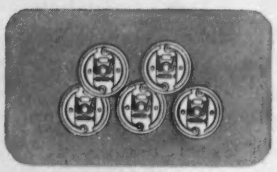
It's the industry's MOST ADVANCED shovel-crane

Included as standard equipment are foolproof power steering and independent rapid boom hoist. These and many other advantages enable you to secure greater output at lower cost.



Fingertip, Speed-o-Matic control is easy on the operator . . . cuts end-of-the-shift letdown . . . helps increase output up to 25%! Smooth, instant response eliminates jerk, jump or lag.

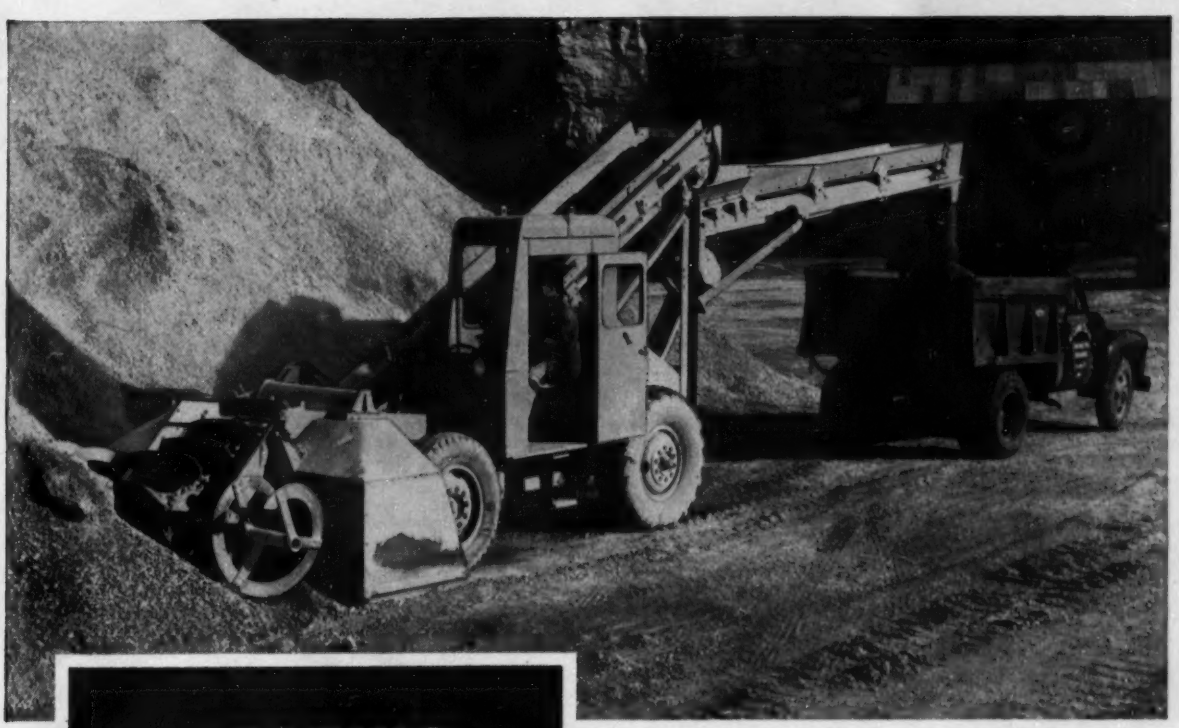
Greater usable hp, more live weight The LS-98 advanced design insures more efficient application of engine hp...incorporates greater live weight and strength to utilize extra hp.



Interchangeable, shoe type clutches The exclusive, self-adjusting Speed-o-Matic clutches are internal-expanding, easily accessible, all are interchangeable. Shells are alloy cast iron.

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

LINK-BELT SPEEDER



LOADING UP TO 10 YDS. A MINUTE

That loaded belt on this Athey HiLoader means loads of profit for this quarry operator in Southern Illinois. The HiLoader is equipped with the new Self-cleaning Moldboard that offers a wider width of gather and protects the machine from cave-ins or spill-over when working in high, loose stockpiles.

Athey HiLoader offers steady, high-speed loading!

The rated capacities of most loaders shows only what the machines can do in ideal conditions—but it's the ability of a loader to push out yardage minute after minute, hour after hour that counts. The 10 cu. yds. per minute rating for the Athey HiLoader has been determined after many actual work hours on many applications. Its ability to turn out this top production, hour after hour, is what makes the HiLoader profitable for any material handler.

The HiLoader is built with strength and quality to work with a minimum of maintenance through thousands of tough hours. With proper maintenance, the HiLoader's hourly output is limited only by the operator's ability and available hauling units.

Your Athey-Caterpillar Dealer can show you the many quality features of the better-built HiLoader . . . and he can show you how it will perform on your work. Just call to arrange a demonstration or write to . . .

ATHEY PRODUCTS CORPORATION
5631 West 65th Street • Chicago 38, Illinois

Send for the colorful, new booklet on the Athey HiLoader—

IT'S FREE!

Loaded with facts and figures the HiLoader booklet will be sent on request.

Athey
PRODUCTS CORPORATION

These stud welded

fasteners will change

your thinking

about applying sheet roofing and siding

When KSM Korr-Weld Fasteners are used, studs and pins become an integral part of structural steel members and last the life of the material they secure.

All application work is from top side of roof or one side of wall, eliminating need for duplicate crews and scaffolding.

Each stud has designed-in advantages to assure minimum installation time and maximum holding power. The precision-centered solid flux assures a good weld every time.

Write for complete data on KSM construction fastener methods for application of corrugated asbestos, steel, aluminum or flat asbestos and insulation board. KSM Products, Inc., 310 Woodland Avenue, Merchantville 8, N. J.

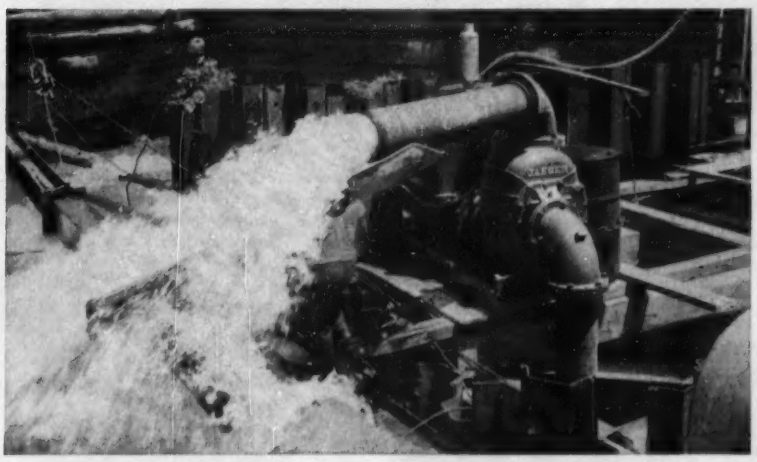
KSM PRODUCTS INC ®
ARC WELDING STUDS

fast...secure...low cost **STUD WELDED CONSTRUCTION FASTENERS**

Hi-performance Jaeger pumps cut water-handling costs

New Model 2PN moves all the water a 2" hose can handle

This latest Jaeger 2" pump delivers its rated 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm slower than similar pumps). It will actually pump all the water that can be pulled through a 2" suction line under average pumping conditions. You'll find it conservatively rated, even at heads well above 100 ft. Weighs only 190 lbs. including big pneumatic tires, measures only 24" x 21" x 26" high, yet it's built for heavy duty service with 20% steel shell, reversible liner plate, long-life Jaeger Lubri-Seal on shaft, impeller adjustable for wear and powerful Wisconsin AKN engine of 5.3 hp at 2500 rpm.

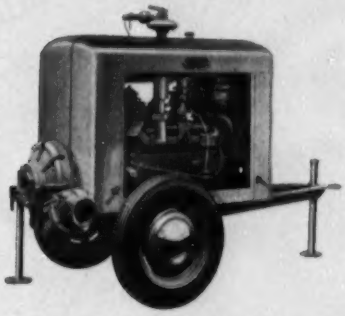


Pumping 4,000 gpm with low-cost diesel power

Because they develop their full rated volume at low operating speeds, big Jaeger pumps are ideally suited for diesel operation on big cofferdam and well point work. The Jaeger Model 10PD above is pumping 4000 gpm at 1500 rpm. This high efficiency at fuel-saving, engine-saving speeds is an exclusive characteristic of Jaeger "Sure-Prime" pumps. It requires larger shells and impellers but pays off in performance. Jaegers prime without engine-racing, don't vapor-lock on hard pulls, consume less fuel and average thousands of hours longer service than pumps that must run at higher speeds.

Latest type jetting pumps in 3", 4", 5", 6" sizes

For a wide range of volumes, and pressures up to 275 psi, Jaeger has developed the most modern type of high pressure pumps . . . self-priming at the rate of 1 second per foot of lift, equipped with enclosed impellers, labyrinth sealing rings, positively lubricated shaft seals, automatic spring-actuated check valves, heat-resisting stellite-valved engines:



Model 3CPH delivers 420 gpm at 40 lbs., 125 gpm at 130 lbs., with air-cooled Wisconsin VF-4 (25 hp @ 2400 rpm).

Model 4CPH delivers 700 gpm at 75 lbs., 325 gpm at 200 lbs., with 6 cylinder engine of 218 cu. in. displacement (80 hp @ 2500 rpm).

Model 5CPH delivers 825 gpm at 80 lbs., 200 gpm at 250 lbs., with 6 cylinder engine of 236 cu. in. displacement. (95 hp @ 2600 rpm).

1½" to 10" Electric Pumps

Jaeger "Sure Prime" pumps with electric motor drive are available for all types of dewatering, including the operation of Jaeger Well Point Systems. The characteristic low speed (1150 rpm) operation of Jaeger 6" to 10" electric pumps results in much longer life. Jaeger's oversize shells, holding more priming water, also prevent overheating and vapor-lock even when exhausting the longest well point header lines.

For engineering service on pumping problems, or specific information about any Jaeger pumps, see your Jaeger distributor or write. For file data, request Catalog P-4.

THE JAEGER MACHINE COMPANY

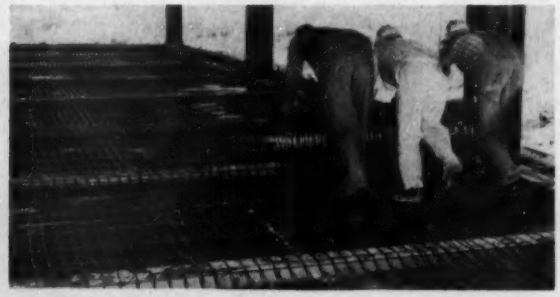
800 Dublin Avenue, Columbus 16, Ohio

TRACTOR LOADERS • COMPRESSORS • CONCRETE MIXERS • PAVING MACHINES

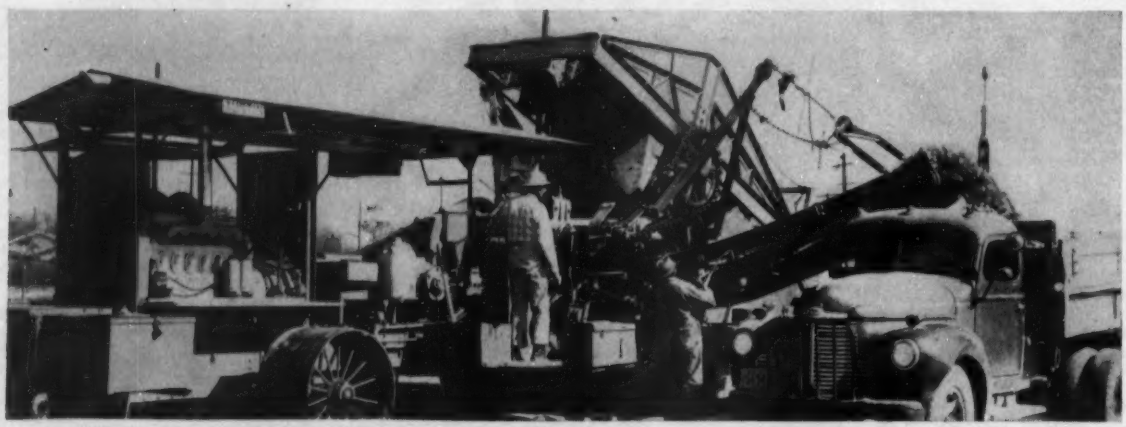
Construction News in Pictures

DRAGLINE LOADS SCRAPER — J. A. Petty Construction Co., Longview, Tex., excavates 30 ft below ground in connection with the strengthening of the east levee of the Trinity River at Dallas for the Corps of Engineers. The Lorain 820-K dragline with 2-yd Hendricks bucket on a 70-ft boom loads up to 2,000 yd per 10 hr into Allis-Chalmers and Le Tourneau scrapers.

SUPER SLOW TRAFFIC — Puget Sound Power & Light Co., Seattle, got permission to haul four 15-ton transformers across a small bridge, considered unsafe for such a load—providing the bridge was protected against damage. The power company laid a temporary deck with long 8x12-in. timbers spanning several trestles, pulled the transformers across on pipe rollers.



MESHING THE FLOOR — Welded wire fabric is unrolled on the 16th floor of Denver's 23-story Mile High Center building under construction. Reinforcing mesh is draped from the beams drooping to near the hung plywood forms to furnish positive reinforcement in midspan. Air-entrained lightweight structural concrete is poured around the 3x16-in. mesh. Spans measure 8 ft 4 in.



EASIER WITH DIESEL — Hartwell Construction Co., Houston, specializes in the construction of sewers, and its big multiple-bucket Austin ditcher is called upon to dig trenches as wide as 10 ft and 28 ft deep. Recently, a new power plant was installed, with only minor adjustments to the equipment. The new engine is a 6-cyl General Motors diesel driving the ditcher through an Allison torque converter. Hartwell operators control the machine through adjustment of the engine throttle.

(Advertisement)

CATERPILLAR

Speeding 4,000,000 yards of excavation on the Ohio Turnpike

A fleet of Caterpillar-built machines and engines is moving the total excavation on contract sections C-56, 57, 58, 59 of the nation's newest turnpike project. One overpass doesn't make a turnpike, but it helps explain how V. N. Holderman & Sons, Inc., is doing this big job.

LOADING TIME 35 SECONDS – and it's an all-Caterpillar performance. Loading a No. 20 Scraper is a Sierra loader pulled by a D8 and powered by a D318 Engine. The DW20s, with a 20-yard load, make the 1.8-mile round trip in six minutes and 20 seconds. They work six days a week, nine hours a day.

NEAR the western end of the 241-mile Ohio Turnpike, big yellow machines and Caterpillar* Engines are rushing to completion an important 14-mile section. The contract – approximately $10,250,000—was won by V. N. Holderman & Sons, Inc., Columbus.

Among other things, it calls for moving 4,000,000 yards, nearly all borrow. Total borrow for the entire Turnpike is 30,500,000 yards, so Holderman is moving more than 10 per cent of the total.

To do this big job quickly, the contractor has called on a fleet of powerful Caterpillar equipment – four DW20s, four DW21s, 18 D8s, three D7s, four No. 12 Motor Graders, three No. 80 Scrapers, and three Cat* Diesel Engines to power a Sierra loader, a Lima crane and a Bucyrus-Erie dragline.

One job—an overpass—in section C-56 illustrates how Holderman is using Caterpillar teamwork to do the job. A Bucyrus-Erie dragline with a 2¼-yard bucket is changing the channel of a stream to run into a box culvert. It is powered by a seven-year-old D17000 Diesel. Extent of repairs on this hard-working engine: one fuel pump. Not far away a D318 is powering a Lima crane unloading steel for the bridge.

A Sierra loader, powered by a D318 Engine and pulled by a D8, is loading three No. 20 Scrapers pulled by DW20s, which make a round trip of 1.8 miles in 6⅓ minutes. Nearby a No. 12 Motor Grader is grading, a D8 equipped with a No. 8A Bulldozer is leveling, and a D7 is pulling two sheepsfoot tampers.

And in the borrow pit a D8 is push-loading three DW21s which haul to the fill near the bridge.

This fast, efficient, smooth-running Caterpillar combination is one reason that the Turnpike expects to be open to traffic by October 1, 1955. Holderman & Sons, like so many contractors, knows the many advantages of standardizing on Caterpillar equipment for profit-building performance.

Many engine parts are interchangeable, cutting down tremendously on the parts inventory. Operators and mechanics learn one make of machinery, and can get the most work out of it. And, most important, you get quick, efficient *one*-stop service from *one* dealer.

So follow the lead of road-building leaders. Be wise and standardize on Caterpillar equipment.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS, U. S. A.

*Both Cat and Caterpillar are registered trademarks—®

JUNE, 1954 • VOLUME 35 • NUMBER 6

HAROLD W. RICHARDSON, Editor

CONSTRUCTION METHODS AND EQUIPMENT

Harold W. Richardson

CONSTRUCTION has lost a champion. In the untimely death last month of Harold W. Richardson, editor of this journal, the construction industry lost one of its most-respected and most-articulate spokesmen, and the construction fraternity lost one of its best-loved men.

Rich was a true champion in every sense of the word. As a leader and believer in the construction industry, he was quick to defend it against unjust criticism. And he himself was recognized as a competent engineer, topflight construction man, and unexcelled technical editor.

In championing construction, Rich was not blind to the industry's faults and shortcomings: he was quick to take it to task when it went astray. But his was always an honest and constructive criticism—a pointing of the way toward better things. Whether meting out criticism or praise, Rich had nothing to sell but the good of the construction industry. He sold it hard and he sold it well. He sold it honestly. His broad outlook, his sure knowledge of construction, his unwavering integrity, his down-to-earth descriptions—all of these made him the effective spokesman and leader he was.

Rich was no armchair editor. His favorite haunt was the construction job, and earlier he had spent five years there in the field as engineer and superintendent for Bates & Rogers Construction Corp., Chicago, after graduation from the University of Colorado in 1923. In his 26 years with CONSTRUCTION METHODS AND EQUIPMENT and its sister publication *Engineering News-Record*, Rich racked up nearly 700,000 miles of editorial travel. And he soaked up construction know-how and made friends every mile of the way. As a technical war correspondent he covered activities of the Army Engineers and Navy Seabees in Alaska, the Aleutians and the Western Pacific. He was the first man to traverse the full length of the Alcan Highway and was with the first contingent to reach atom-bombed Nagasaki.

Throughout his travels, Rich's strength lay in his unfailing enthusiasm for all phases of construction. He felt that each new project offered an opportunity for the contractor to advance the art and science of construction. And he was impatient with those who neglected their opportunities, who did not take advantage of ways to build faster, better, and at less cost.

As the men in the field built with steel and concrete, just as surely and just as well did Rich build with ink and paper. He had the ability to translate his knowledge and beliefs into words that other construction men could read easily—and with profit. He had a true inquisitiveness to know the how and the why. He was an enthusiastic seeker after the truth who was never satisfied until all questions in his own mind were resolved. Rich rightly believed that the proper function of technical journalism is not merely to list the number of machines, or bricks, or yards of dirt involved in a project. He was more anxious to tell how new machines, new materials or new construction methods were doing a better job.

While he had a tremendous respect for the machines and materials of construction, it was the men of the construction industry that Rich admired most and in whom he had an abiding faith. He believed they would measure up to any tasks confronting them in peace or war. He believed they would continue to devise the tools and techniques necessary to keep construction advancing at a rapid pace. He did all in his power—and it was a considerable power and an effective one, used wisely—to aid and accelerate that advance.

Part of Rich's aid to the industry he loved and to which he devoted his life was in association work. But Rich was not an idle joiner; he was active in the organizations he joined. He was a member of ASCE, The Moles, ARBA, and the Society of American Military Engineers. He was privy to the affairs of AGC, the Construction Industry Manufacturers Association, and the National Safety Council. He served as construction industry consultant to the War Production Board and National Production Authority. He also found time to

co-author two construction books and was at work on a third at his death of a sudden heart attack. Truly, Rich packed a lot of hard work and a lot of living into his 53 years.

Rich's friends were legion. He was ever ready to listen sympathetically to their problems, to offer help and sound advice. He was confidant and counselor to persons on all levels and in all segments of the construction industry. Nor was the trust they put in him ever misplaced.

Rich had a rare compassion and humility. It was a continuing source of wonderment to him that he was held in such high regard by so many important people. He did not seem to realize how thoroughly he had earned—and how richly he deserved—that admiration and respect.

At many an important gathering of industry leaders, Rich would murmer, "Why right here in this room there's enough construction talent to rebuild the world." Well, there still may be enough construction talent left to rebuild the world. But the work will be a little harder and far less enjoyable, the job will take a little longer, and the completed project will not be as fine—because Rich is no longer here.

Richisms...from his editorials

Rock Foundation of Economic Stability: Construction has no surplus inventory. We can't find a single bridge, dam, tunnel, highway or waterworks that has been built in advance and stored in somebody's warehouse waiting to be sold. Construction can't be involved in any rolling adjustment . . . can roll only one way, and that's ahead.

Do You Really Know Your Costs: It's the contractor who doesn't know costs who is doing most of the plunging and wild bidding today. He's been spoiled by several years of construction prosperity . . . he has never become proficient at job management, so he's in double trouble now.

Details Make the Job Click: . . . construction advances through improvement in details, by better application of equipment and by intelligent planning and management. And these advances can take place on jobs both large and small.

There Ought to Be a Law (to protect sub-contractors) . . . Nuts!: Construction at best is a complex procedure. The general contract award system has brought to this country the most efficient and satisfactory method . . . For the best interests of all, this system should not be changed.

One United Construction Union: . . . would be a blessing to contracting in the reduction of thousands of contracts. The present chaotic situation where one union works 6 hours, another 7 hours, still another 8 hours, all on the same job, would no longer exist. A workman would develop and be upgraded according to his ability. These capable fellows would become construction men, not prima donnas.

Money Talks: . . . we've enjoyed several years of high construction volume under high cost levels. But had costs been lower, the volume might have been much higher in proportion, and it is certain that we are not going to maintain the present volume unless lower costs entice more construction needs into construction activity.

Job-Placement Physical Examinations: They are intended to determine whether an employee is fit physically to perform certain duties under certain conditions, not to bar a man from employment . . . . are found to be particularly effective for the more hazardous construction operations, and to hoisting and equipment operation where the hazard extends to others. . . . Examinations of persons being considered for work in high places should concentrate on physical deficiencies that might cause dizziness or blackouts. Eyesight and hearing are important in other cases. Hernias are sought out where heavy lifting is involved. Labor leaders are prone to oppose . . . If a man is not physically fit to perform certain operations, certainly no intelligent labor leader would insist on that man being employed at a risk to himself and fellow workers.

See Here, Young Man: If you have not already made up your mind as to what to tackle as your life's work, take a look at construction. Ah, there's a career for you that can't be beat for glamour, excitement and downright soul-tingling satisfaction in sense of accomplishment.

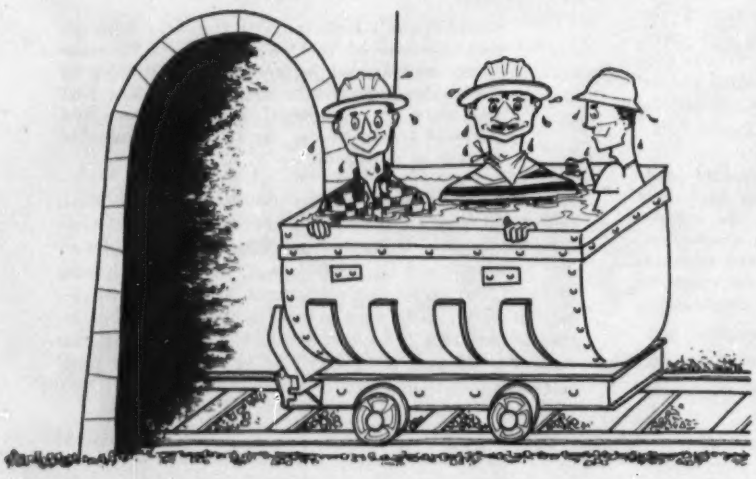
Machines Are Safer Than Men: Don't blame the machine when you have construction accidents involving equipment, for the odds are that the mishap was caused by human rather than mechanical error. . . . the primary responsibility of construction accident prevention belongs to the contractors . . . if you don't assume that responsibility, you are going to find your operations hampered more and more by codes and restrictions.

Construction's Role in Civil Defense: Contractors, because of their equipment, skill, manpower and know-how, are able and willing to take a leading part in civil defense. The fact that they are organized into local, state and national groups makes them the more valuable in case of emergency.

The Gates of Hell Stand Ajar: (From Rich's last editorial, written following the explosion of the world's most savage hydrogen bomb): It matters not, little man, the color of your political creed . . . It matters not if you jarred those Gates of Hell open in an offensive or defensive mood . . . All that matters is for man to come to his senses and determine to live one with another around the earth . . . All that matters is for man to turn to God and forsake the Devil that seeks to destroy him.

Sweat-drenched powder men loading holes at heading find that...

Digging Tecolote Tunnel Is Hot Work



L. L. Wise, CM&E's West Coast editor, visited the Tecolote Tunnel just two days before the death of H. W. Richardson, CM&E editor. The following day he wrote this report to Rich. It is published just as he wrote it. Wise was the first reporter to be admitted to the tunnel since work was resumed.

Santa Barbara, Calif.
May 11, 1954

DEAR RICH:

I'll bet you never heard of going to work in a bathtub. Well that's literally what workers do on the Tecolote Tunnel near here to combat the intense heat developed by 113 F ground water. They ride

Tecolote Tunnel Background

THE 6.4 MI TECOLOTE TUNNEL is a key element of the Bureau of Reclamation's Cachuma Project in California. It brings irrigation and municipal water from the Santa Ynez Valley through the mountains to the coastal area near Santa Barbara. Contract for driving the 7-ft horseshoe bore (inside finished concrete) was awarded early in 1950. And for a while progress was good. But the unforeseen quantity and temperature of ground water (4,000 gpm and 112 F) encountered prompted the contractor to close down the job for re-study about a year ago.

After detailed study by its own people and by consulting boards, the Bureau decided that the unforeseen conditions were not within the spirit of the original agreement. So new prices were negotiated for completing the 4,716 ft of tunnel that remained to be driven. Officially the contract is still with Halvorsen Constructors, holder of the original $4,750,455 contract. It is being executed by a joint venture of Coker Construction Co. and Peter Kiewit Sons Co.

Most significant element is that the remaining 11,100 cu yd of tunnel excavation is now priced at $447 a yard, as compared with the original $44. The new figure includes grouting, if any, and at the contractor's option. It also includes water handling. Grouting was a separate item originally. And the new agreement is good up to 10,000 gpm inflow or 130 F water temperature. That makes the net increase of the work slightly in excess of $4 million.

MUCK DUMPING spills a lot of water out of the car, too. High water content is due to plugging of drain holes so that cars can be filled with water to take workmen in and out of the hottest part of tunnel more comfortably by riding submerged.

through the hottest part of the tunnel submerged to their necks in 1¾-yd muck cars. I did just that yesterday in the course of digging out data for CONSTRUCTION METHODS AND EQUIPMENT on this fascinating tunnel job.

In all your 30 years of visiting construction jobs to write articles about them, I'll bet that you never have run into one quite like this. In the 8½ years I've been on the job out here on the West Coast, this one is near tops for interest and drama. Here's a step-by-step account of my visit:

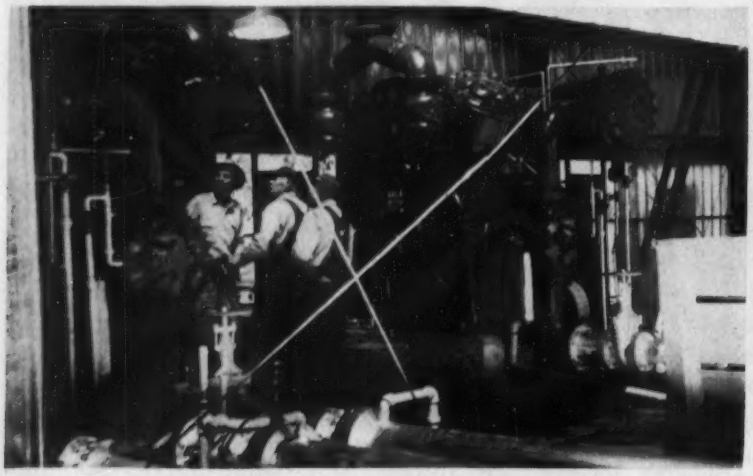
I got to the job a little after the day shift started work after the Sunday shut-down. I talked briefly with Al Coker, sponsor of the work, whom you remember from war-time construction in Alaska. Al had to beg off taking me into the heading as he was leaving shortly for his Eklutna Tunnel job in Alaska and had some paper work to clear up.

At first Coker didn't think I ought to take my camera underground as the water might damage it. But we decided I could do it by using a couple of plastic-bag covers that come with E. D. Bullard Co. hard hats. Coker turned me over to his chief engineer, Don McGregor, and suggested that I be outfitted in his "diggers."

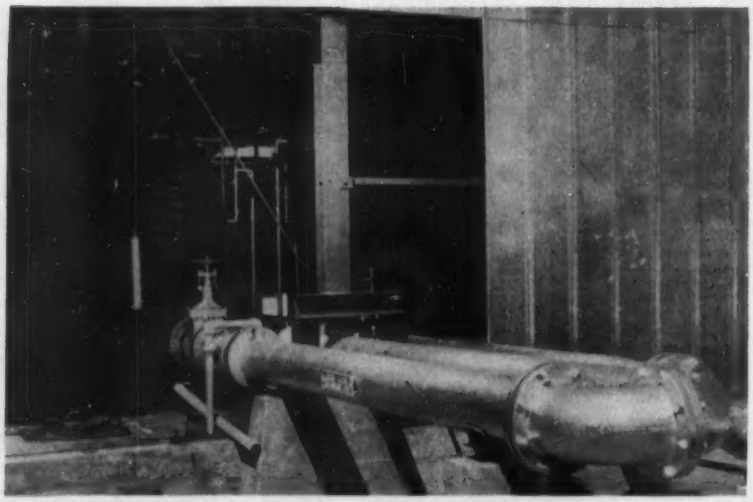
First thing Don had me do was sign a waiver holding the Coker-Kiewit organization blameless should anything happen to me underground. I learned later that before anyone is hired for underground work he is subjected to a rigorous physical examination that includes chest X-rays and electrocardiograph heart test. This has paid off handsomely, as there has been only one minor heat prostration case in two months underground, as compared with almost daily occurrences in the early operation before these elaborate but useful precautions were taken.

Next I was outfitted. The outfit included a hard hat, calf-length rubber boots worn without shoes, Coker's diggers (an old pair of pants and T-shirt) and a battery belt to carry power supply for my headlamp. Coker's pants were too big for me, so I had to use my leather belt which got thoroughly soaked but not beyond use. I took my camera out of its leather case, mounted the flash equipment and sheathed it in a double layer of plastic bag. I carried a couple of extra rolls of film wrapped securely in plastic. And I took my wallet along—also wrapped in plastic. Flash bulbs I carried loose in the

AIR IS PUSHED into tunnel by a 100-hp Sutorbilt blower operating at 10 psi. A second blower, 2 mi in, boosts clean outside air another mile to the heading.



COMPRESSED AIR comes from these two Joy twins rated at 1,640 cfm each to power tools at heading. Contractor is installing two Joy Turbinair pumps to remove water from tunnel.



AFTER-COOLERS made by R. P. Adams Co. receive air from compressors at about 120 psi and reduce temperature, condense and bleed off moisture so that air to tunnel is dry.

pants pocket, as water wouldn't hurt them.

While we were waiting at the portal, McGregor handed me a salt tablet that I dutifully swallowed. We also put my camera in an enclosed box on top of a telephone transformer to warm it up and minimize condensation on the lens.

After awhile a train came out with Ray Blasongame, project superintendent, and H. E. Franey, safety engineer, on it. Franey had just made his regular first shift check on conditions in the tunnel. This includes tests for methane gas, as well as both wet and dry bulb temperature readings at several spots. He also measures water temperature.

Both Franey and Blasongame were completely soaked. One of the men stuck a cigarette in Franey's mouth and lit it for him —he was too wet to handle it himself and, of course, you can't smoke underground.

We started in on a man-haul car pulled by an Atlas electric locomotive constructed only 32-in. wide to permit passing tracks without enlargement of the tunnel—it's 7 ft 9 in. between steel ribs. First sensation on entering the bore was of warm, moist air with occasional traces of hydrogen sulfide. I recalled how lots of people spend good money to get just such treatment.

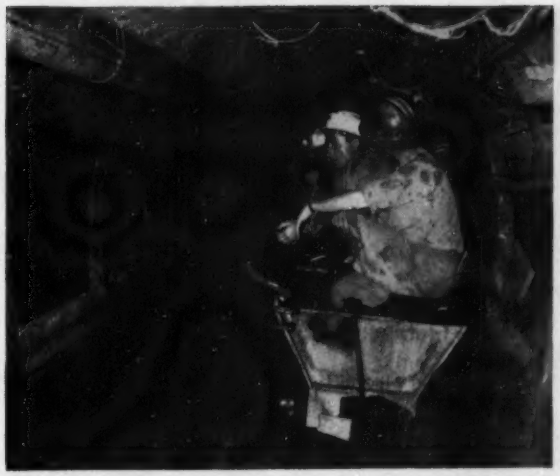
Pump Room

Progress of our train was fairly slow and, at the one-mile switch, the locomotive was sent back. The operator had forgotten to check the batteries when coming on shift, and it most certainly would not have got us to the heading.

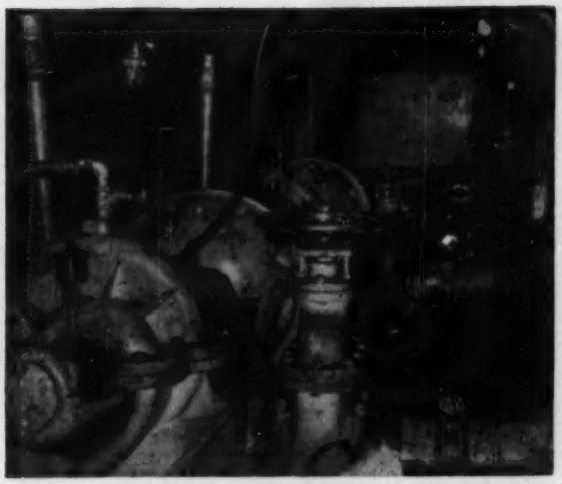
About 11,000 ft in we came to the pump room. This is an enlargement of the tunnel to 17-ft width. Main equipment includes two Fairbanks-Morse centrifugal pumps with 10-in. suction and 8-in. discharge rated at 3,000 gpm under a 300-ft head. Reason for the pumps is that the tunnel slopes only 8.4 ft in its 6.4-mi length. Thus water has to be pumped out.

The pumps are powered by 250-hp General Electric motors operating at 440 v. Power comes into the tunnel at 2,300 v, and is processed by voltage regulators and transformers at the pump station.

A 3-in. hose is mounted in the tunnel at the pump station. Discharge from the hose sprayed the train as it passed. Time was taken to fill a couple of empty muck cars. Then the train was slowly backed,



CLOSE QUARTERS in small tunnel are accented by man-haul cars at passing track. Workers get water drench for tunnel passage.



PUMP ROOM in tunnel has two electric-driven 3,000-gpm Fairbanks-Morse units to move high-volume seepage.

AIR MOTOR-DRIVEN PUMP is readied for installation in the pump-room inside the tunnel. Pump is a Jaeger, will be powered by the Joy Turbinair motor at the left.

and each of us on the man-haul car was thoroughly soused. While being soused, I was a little concerned about my camera, but I crouched over it to give it such extra protection as I could.

Purpose of the soaking was to cool us enough to withstand the mile-long haul to the heading. Although temperature at the pump station was 93 F with 100% humidity it got hotter between there and the heading. We reached the heading after passing through the nearest thing to Hades that I want to see.

At the tunnel face the miners were just completing drilling a 6-ft round. They used an Ingersoll-Rand jumbo equipped with three air-operated drill arms. I-R carbide inset bits are used almost exclusively to minimize hauling steel in and out of the narrow tunnel.

The heading seemed relatively cool. I found out later that it was 94 F with a 92 F wet bulb reading. A 14-in. pipe blasted air at about a 4,700-cfm rate. This air felt cool and refreshing, but it turned out that the temperature was 103 F. Reason for the cool effect is that it had a wet bulb of 72 F or a relative humidity of about 22%.

This illustrates the first of three factors that, according to McGregor, the Coker-Kiewit outfit considers important. These are: (1) dry air, (2) air in motion and (3) cool air. On these hot underground jobs, it's the humidity that "kills you." So first effort in making the job workable was to get dry air into the tunnel. Then they tried to get enough quantity so that the air would continue in motion. And they are taking steps to provide cool air.

Fan air is pushed into the tunnel by a 100-hp Sutorbilt blower operating at 10 psi. A second Sutorbilt blower at the pump room 2 miles inside the tunnel boosts the fan air the remaining mile to the heading. This air usually comes in at a low humidity just by being picked up from outside. And it is pushed to the heading in enough quantity to keep the air in motion.

Air Is Dry

Compressed air for powering the tools at the heading is provided by two Joy twins rated at 1,640 cfm each. This air at about 120 psi is passed through after-coolers at the compressor house. These R. P. Adams Co. installations are guaranteed to reduce air temperature within 2 F of the cooling water used. But the important point is that in reducing the temperature, moisture is condensed and bled off so that the compressed air is dry.

One of the biggest problems is pumping water out of the tunnel. Slope of the tunnel is so flat that the 4,900 gpm now flowing in won't flow out by gravity. So besides the units at the pump house there are a number of 3-hp Jaeger pumps scattered through the tunnel. These are all electrically driven.

But Coker-Kiewit is in the process of installing two pumps driven by Joy Turbinair motors. The compressed air in the process of oper-

(Continued on page 209)

Driving watertight shells to 30-ton bearing is first step by which . . .

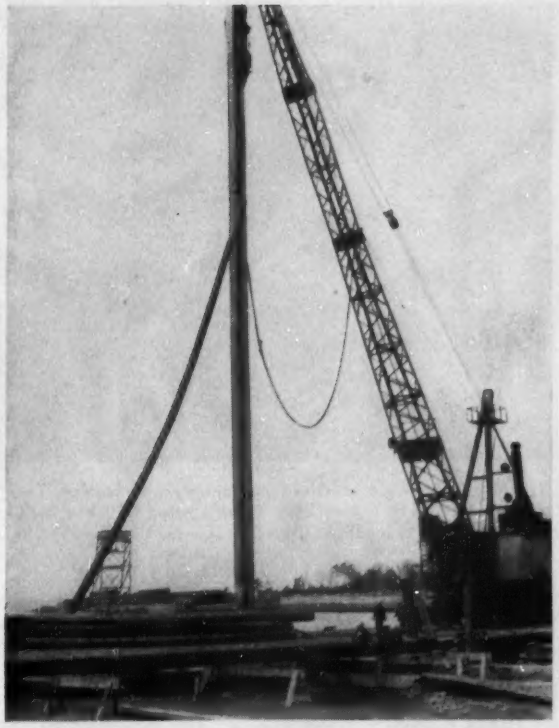
Pneumatic Piles Support Landship for Army's Navy

By HENRY T. PEREZ, Senior Associate Editor

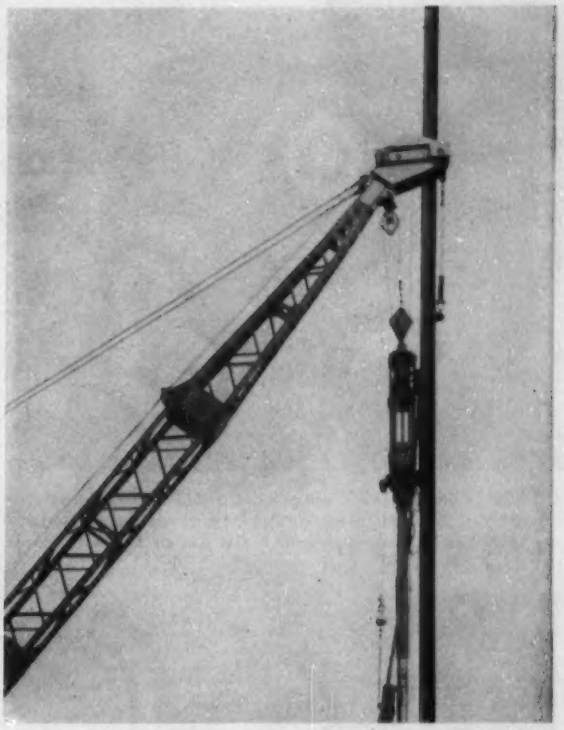
MORE THAN 600 cast-in-place concrete piles—which were poured in thin-gage steel shells driven by an air-expanded mandrel—support a ship ashore at Ft. Eustis, Va. The economical Cobi piles form the substructure of a wharf-like platform carrying a replica of a cargo vessel for training Army stevedore troops.

For this so-called Landship, Tidewater Construction Corp. had to drive 12-in. dia pile shells 65 to 70 ft long through as much as 10 ft of water and 40 ft of James River muck to fetch up in a hard marl. Despite the fact that they were driven to a 30-ton bearing, the 16-gage spirally corrugated shells remained completely watertight. That's because (1) they were driven in one piece with a Cobi pneumatic mandrel that gripped them full length from tip to butt and (2) the shell's lengthwise spiral seam was locked both by crimping and by a continuous fusion weld during manufacture. Average piledriving progress: 25 piles per 8-hr day.

To drive the piles, Tidewater brought in a barge-mounted 50-ton Wiley Whirley with a 120-ft boom that carried a special fitting at its tip. Suspended in this fitting by a line from the crane drum, and free to slide vertically through it, was a 150-ft spud lead. On this 14-in. WF 112-lb spud rode a Vulcan No. 1 hammer.



FROM STORAGE YARD, floating Whirley picks 12-in. pile shell 70 ft long for driving with air-expanded mandrel (hanging alongside spud lead). Spiral bars on mandrel fit shell's corrugations.



AT BOOM TIP, 14-in. WF 112-lb spud lead is held by cable, and slides through special fitting. The 80-ft Cobi mandrel hooked to Vulcan No. 1 hammer is made up of one 60- and one 20-ft length.

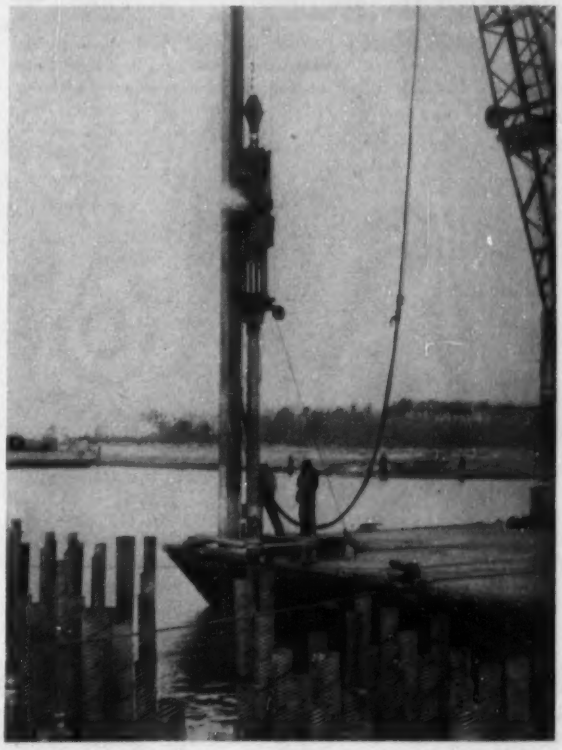
Suspended from the base of the hammer was an 80-ft Cobi pneumatic mandrel. (See "Air-Expanded Mandrel Drives Longest Thin-Shell Piles," CM&E, May '52.) This ingenious tool consists essentially of four quadrant-shaped steel segments and four nylon and rubber tubes that run lengthwise between them. When 125-psi air is introduced into the tubes, they force the steel sectors outward to clamp the pile shell tightly throughout its entire length. Half-round bars welded helically to the surface at frequent intervals (and which correspond with pile-shell corrugations) help give the expanded mandrel its non-slip grip.

Shells Come in 60-Ft Lengths

For the Landship, pile shells were delivered to the job in 60-ft lengths. The 12-in. constant-diameter Armco Hel-Cor units were spliced out to 65-70 ft by welding, and a driving boot was welded on to close the foot.

To insert the driving mandrel in an assembled shell, the floating crane placed the latter in a 16-in. pipe-cased vertical hole near the shell storage pile and lowered the mandrel inside it. When the mandrel was expanded, the unit was picked up, spotted and driven. Final 30-ton bearing was reached at 30 blows per ft of the No. 1 hammer.

Fifty of the 601 piles had to be driven on a batter of 4 on 12. At this angle, and with the long spud lead held only by the boom-tip fitting and by a frame projecting from the bow of the crane barge, the heavy hammer riding down the spud caused the latter to deflect considerably. So, to take some of the dead weight and help relieve this condition, the crane's whip line was reeved through a snatch block on the hammer



AT DECK LEVEL bottom of 150-ft spud lead is guided by welded frame. Cable through snatch block on hammer helps take weight while driving batter piles, is also used to handle pile shells.

CONCRETE MOLD and wood side forms are readied for pouring precast deck slabs that are supported by pneumatic piles. Molds are fitted with compressed-air bond-breakers to aid in slab stripping.

EXTERIOR FORMS are combined permanently with bracing. They are easily erected by bolting front to casting-yard floor and wedging rear to wood kicker. Typical precast concrete panel is 7½x8 ft.

WOODEN DUTCHMEN are fitted to special mold whose corners have been made undersize to take care of variations in precast panel dimensions. Entire form will be well oiled before pouring concrete.

PRE-TIED MAT of reinforcing is placed in readied and oiled form. Plain strips of wood will be nailed atop reinforcing around edges of form to confine concrete and to act as screed strips.

TRANSIT-MIX CONCRETE is delivered by Smith mixer on Mack truck and is consolidated by Mall vibrator. Specs call for 2,500-psi concrete, but contractor uses 3,750-lb mix so can strip sooner.

base and thence back to the heel of the crane boom.

Driven shells were stay-lathed with bolted pairs of 3x8-in. fir timbers as clamps. (Later, these also served as falsework to support forms for pile caps.) Then a reinforcing cage of six 47-ft No. 8 bars, spirally tied, was inserted and the shell was filled with concrete to complete the piledriving operation.

The piles support a 55x312-ft concrete platform and a 35x55-ft marginal wharf at one end. Decking consists of precast slabs spanning from pile cap to pile cap and tied together by beams poured in place between them. The precast slabs, which weigh up to 6 tons each, are an inverted dished affair. They are generally 7½x8 ft in plan, with a 5½-in. thick central section surrounded by edge beams that are 20 in. deep and 6 in. wide.

CONCRETE DECK for Landship takes form as precast slabs are set in ½ in. of grout atop pile caps, and space between adjacent units is concreted to tie them into solid mass. Job calls for 2,300-cu yd of concrete, half of which is in the pile substructure.

Tidewater cast all slabs in a concrete-floored yard at the site. Of the 256 units required, nearly 200 were somewhat typical, so these were poured around 11 oiled concrete reverse molds with wood exterior side forms. As many as 26 slabs were made from a single mold.

The exterior forms were unusual. They consisted of a full-side panel of tongue-and-groove lumber faced with sheet metal and backed by 2x4 studs and top plate, with a raker frame of 2x4s permanently spiked to each stud. Form panel and bracing thus were combined in one unit. At the same time, there were no ties across the top of the pour to interfere with placement of reinforcing steel or concrete.

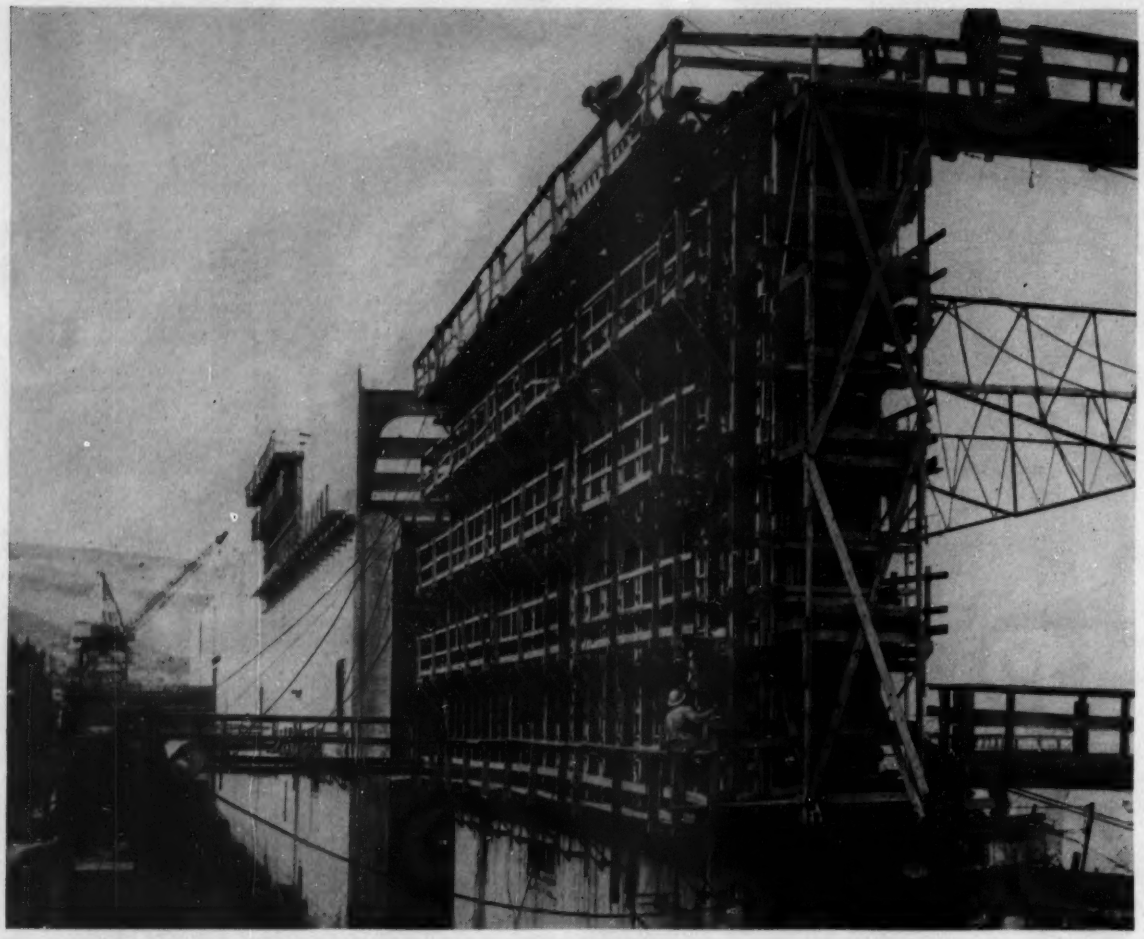
Bolts and Wedges Hold Form

This form assembly was easy to erect and strip. It was held rigidly in place by wedging the rear of the frame to a wood kicker bolted to the casting-yard floor, and by putting a couple of loose pieces of 2x4s over the front of the frame base and bolting them to floor inserts. For stripping, wedges and bolts were removed. Then, when the casting had been lifted a couple of inches from the mold, carrying the side-form assemblies with it, it was a simple matter to tap the latter free.

Forms were stripped and castings removed to storage on the morning of the third day after a pour. Then all molds were oiled, forms were re-set, pre-tied mats of reinforcing steel were placed and 3,750-psi air-entrained concrete was poured to complete the cycle in the afternoon. Between days in the casting yard, the same crew worked on pile-cap concreting or on completion of the beams that tied the precast slabs together after they were set in place for the deck.

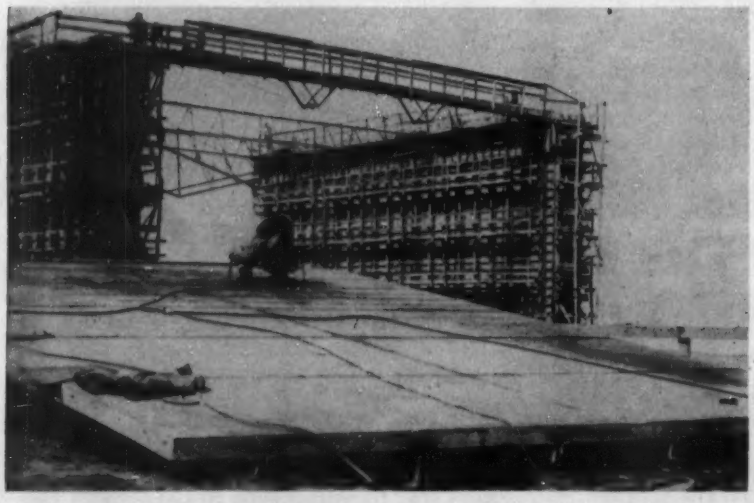
The Norfolk District, Corps of Engineers, is building the Ft. Eustis Landship. Col. Robert B. Warren is district engineer, Lt. Col. John W. Chesley, Jr., is executive officer, and A. L. Burger, Jr., is resident engineer. General contractor is Norfolk's Tidewater Construction Corp., for whom John R. Liles is vice president and general superintendent and Robert P. Jones, Jr., is job superintendent.

PRECAST SLABS for each bent are stored in separate stacks for easier placement in deck later. Marion crane handles weighty units with lines to ¾-in. Richmond anchor bolts in each corner.



Massive steel form, used a minimum of 20 times, is timesaver as . . .

Big Equipment Builds Chief Joseph Plant

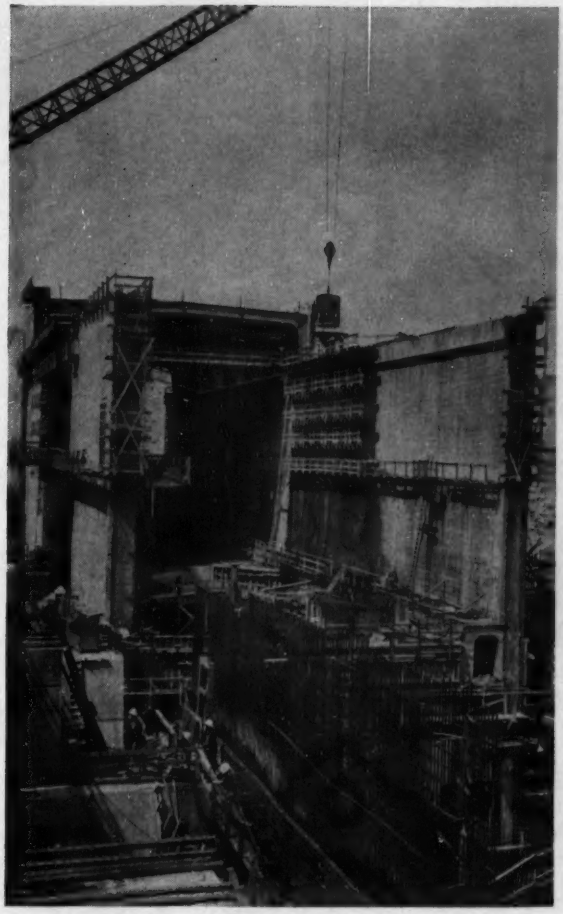


WORKMAN CLEANS face steel of form against a background of forms in place for walls of the powerhouse which are 5 ft thick. Note steel trusses between walls and catwalk for men.

STEEL FORMS are used to an unprecedented degree by Columbia River Constructors on its $40 million contract for the powerhouse at Chief Joseph Dam on the Columbia River near Bridgeport, Wash. Many of them are placed by a rail-mounted 1,000,000-lb Bucyrus-Erie 450 Special Monighan crane.

Work also is proceeding on the dam, where Chief Joseph Builders is employing unique methods in the installation of a bridge surmounting the dam and tainter gates which will control flow up to 1,250,000 cfs through the spillways.

More than 80% of all forms used on the powerhouse and intake structure are made of steel, either in the framework or on the face, or both. Wood forms are used only where three or less duplicate operations are involved. Steel forms are



BUCKET OF CONCRETE swings over forms on far side, as men in foreground prepare forms and reinforcing for continuation of powerhouse walls and construction of intake tubes and penstocks.

PENSTOCK SECTION, 25 ft in dia, rests on cribbing in position under powerhouse service deck. Twenty-seven eventually will be in service to turn generators supplying more than 1,000,000 kw.

used for the first time in construction of the 20 curving 30x50-ft. draft tubes that will carry the spent waters from the powerhouse turbines back into the river. One set of four-section steel forms, bolted together in place, replace slowly built wood forms that previously had been fabricated for each draft tube.

Most spectacular example of repeated use of a single steel form is the 25-ton, arch-shaped device around which openings were constructed in the face of the intake structure for each 25-ft dia. penstock. Twenty-seven such "transisitions" are being built by the contractors around one two-section form, moved after each use by the Monighan, assisted by a Manitowoc 4500 Speedcrane with 140-ft boom or a Washington Iron Works' revolving crane. (See also page 42.)

All the 5-ft thick walls for the powerhouse, 1,540 ft. long under the present contract and ultimately to be 2,036 ft, were formed by only six 32x70-ft steel panels weighing close to 20 tons each. The entire 2,040-ft intake structure, 140 ft high, is being built with steel formwork, including the bell mouth and overhang, as are all the inspection galleries and the tail-race deck.

Framework for the forms consists of 8-in. channel irons joined by welding. Where the concrete is to be exposed to weather, the form is faced with 2x6-in. fir t&g lumber, to allow water absorption. This wood lagging is checked and replaced, if necessary, after six uses. For interior walls, the form is faced with 3/16-in. steel plate, coated with Globe form grease for water absorption.

Initial cost of the forms exceeded $510,000, an average of 90c per sq ft, but reduced labor costs more than offset this expense. Columbia River Constructors figures that a steel form need be used only 3.6 times to repay the initial investment. Since the Chief Joseph forms are used a minimum of 20 times, the initial cost is quickly amortized.

Saving for the steel forms in comparison with wood is estimated by G. M. Shupe, project engineer for CRC, at 30%, largely in the stripping of forms and re-setting, whereas wood forms had to be stripped apart, virtually piece by piece, and rebuilt—often with new material. The steel form simply is moved from one operation to another.

Steel forms enable the contractor also to place an increasing reliance on large equipment, a known quantity, rather than in labor, sometimes an unpredictable quantity. Labor costs were reduced an estimated 25% after the first form, by repetition. Safety conditions were improved and cleaner lines were evident in the finished concrete.

The forms were factory-made by the Blaw-Knox Co. of Pittsburgh,

the Form Engineering Co. of San Antonio, and the Chicago Bridge & Iron Co. They are handled on the powerhouse by two 60-ft gantry-mounted Washington Iron Works' revolving cranes, with a capacity of 22,000 lb in a 150-ft. radius, working from the powerhouse service deck.

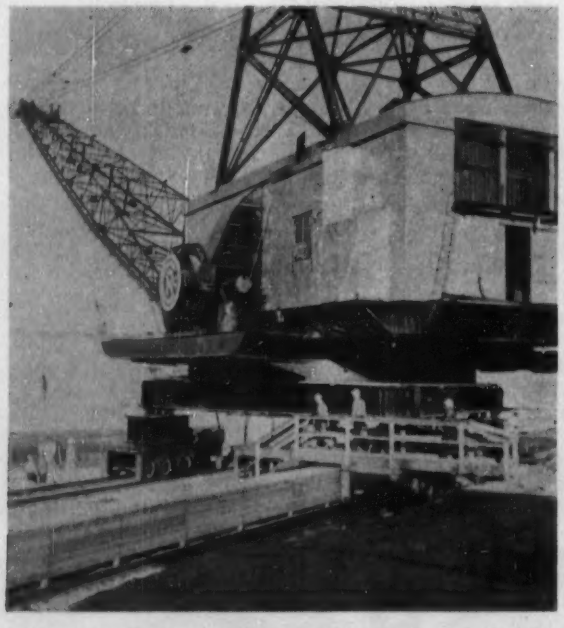
The inverted V-shaped form for the upper half of the penstock opening is mounted on a steel jumbo which is skidded into position. Hydraulic jacks between the jumbo and the open ends of the V are actuated to obtain the correct curvature on the face of the form. After the concrete has set, pressure exerted by the jacks is released, the framework "collapses" on the jumbo, and the form is easily withdrawn from the opening.

The $650,000 Monighan, with 205-ft boom and a capacity of 60,000 lb within a 180-ft radius, is operated along four 132-lb rails the entire length of the intake structure. Brought on rail cars from a canal job in California, it was reassembled at Chief "Joe" and walked under its own power up a ramp with a 20% grade to an anchored platform, constructed by Washington Iron Works at a cost of $100,000.

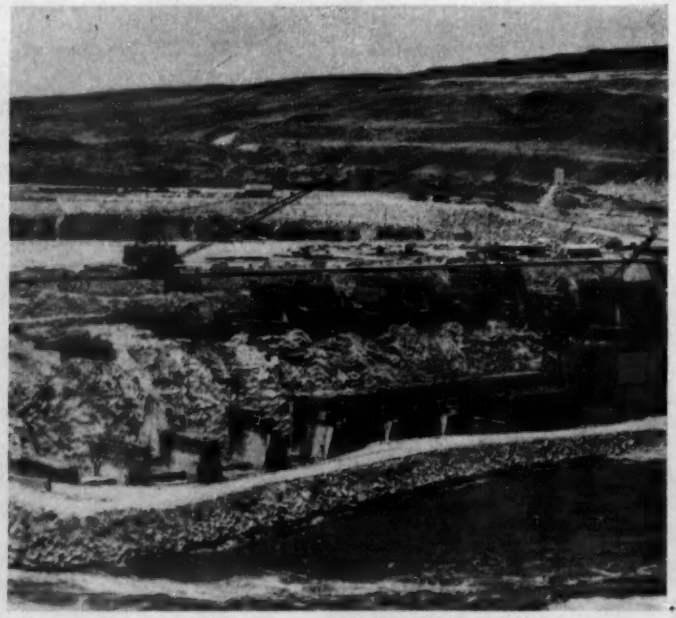
The Monighan's electrically powered undercarriage consists of a 36-in. steel I-beam framework, covered with a 2-in. steel platform and resting on four rolling trucks. Eight steel wheels on each truck are operated by a Master electric motor through a Western Gear reduction box at a 7:1 ratio. Crane and undercarriage together weigh 640 tons.

Power, at 440 v, is provided by a bare trolley, covered with wooden box formed from 2-in. timber. Wood turnstiles at each end of the

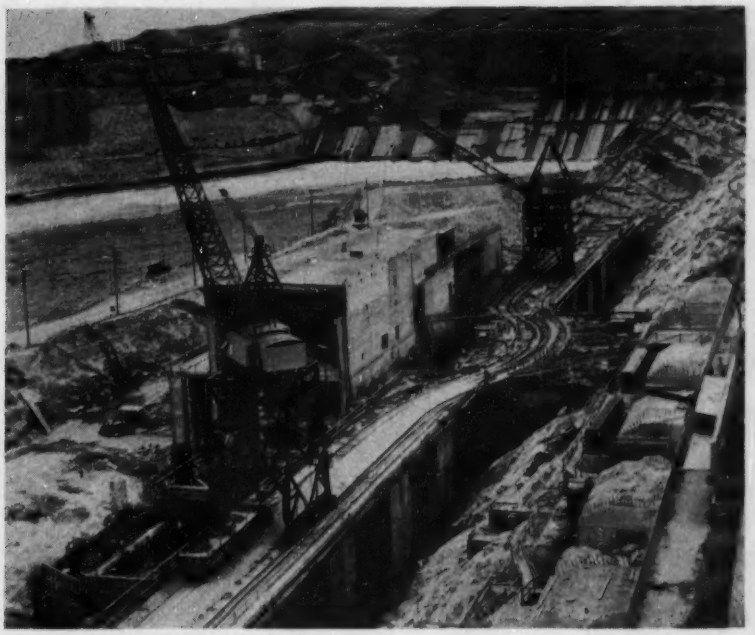
STEEL FORMS FOR DRAFT TUBES are being placed in foreground. Manitowoc Speedcrane with 140-ft boom assists cranes on gantrys. Protecting cofferdam at right will be removed.



GIANT WALKER, 1,000,000-lb Bucyrus-Erie 450 Special Monighan with 205-ft boom and capacity of 30 tons at 180 ft, handles big steel forms and will remove cofferdam. The $650,000 machine moves electrically on four rails, lifts with diesel power.



VAST EXPANSE of huge powerplant and intake structure in the rear is visualized best by view from across the river. Present contract will build units 1,540 ft long but ultimate length will be 2,040 ft. Monster Monighan roams along the rear to handle crane work for intake



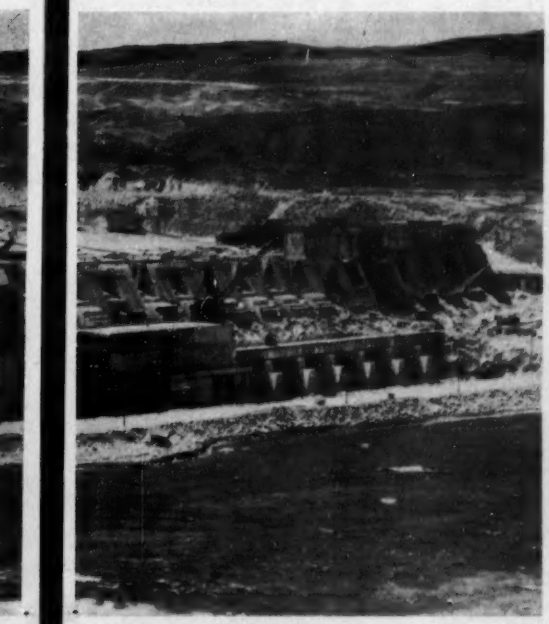
DAM STRUCTURE (in background) and intake section at right form a large "L." Two 11-ton (at 150-ft radius) Washington Iron Works revolving cranes handle materials, place concrete.

machine, whose platform is 13 ft off the ground, make it easier for workmen to climb over this box, some 3½ ft high. Warning bells sound whenever the machine is in motion, and steel aprons ride the rails in front of each truck, as an added safety precaution. Lifting power is provided by the Monighan's own diesel engine.

Three 25-ton General Electric locomotives haul concrete from a Johnson automatic-batch concrete plant to the intake structure and powerhouse, each tow car having spaces for three 4-yd Gar-Bro placing buckets. Each trip brings two buckets of concrete, leaving space for the crane to deposit an empty before picking up a loaded bucket.

Although the Monighan does all the crane work for the intake structure, dividing its time about 20% on yard work and 80% on concrete placement, it can be characterized presently as "a man doing a boy's job," as its present work could be handled by a revolver or two. Its real reason for being on the project is that this fall it will be used to remove the cofferdam protection for the powerhouse and to dredge the powerhouse tailrace channel. This task will involve a total of 700,000 yd of dredging and excavation, including some large rocks which are expected to tax the capacity even of the Monighan—which can reach out a flat 204 ft with its boom and pick up loads as heavy as 22 tons with a 14-yd bucket.

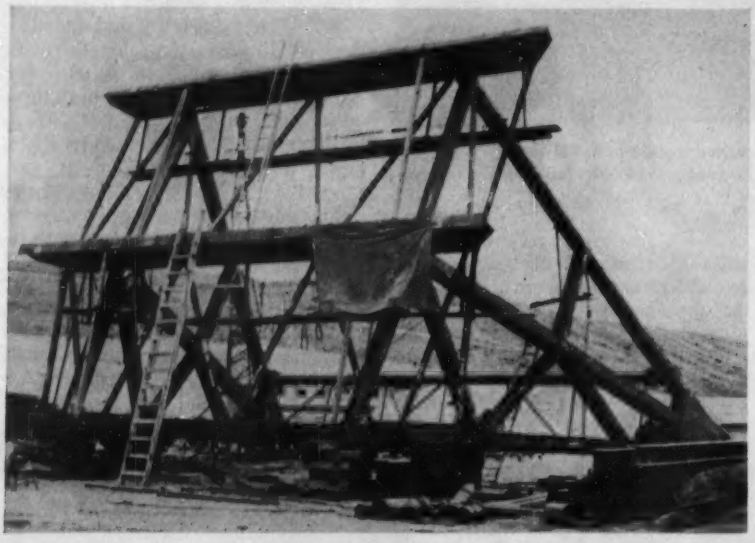
The Monighan will have placed a total of 450,000 yd of concrete in the intake structure before fall, handling an average of 2,000 yd and a maximum of 4,100 yd in three shifts. The powerhouse and intake structure together require a total of 840,000 yd, with completion of



structure. Later in summer it will be brought forward to remove the 700,000 yd of protective cofferdam, swinging a 14-yd drag bucket.

PENSTOCKS GROW PROGRESSIVELY from the powerhouse section up to the intake structure. The 205-ft. boom of the Bucyrus-Monighan reaches way over to place or strip forms and handle buckets of concrete. The Washington revolvers work from side-to-side as needed. Concrete comes from automatic plant with electric locomotives hauling 4-yd buckets.

SKIN FOR TAINTER GATE is welded on the ground to eliminate elaborate staging high up on the dam, make it safer for welders. Finished skin weighs 33 tons, is handled in yard by a crane and hauled to cableway at dam on a 35-ton lowboy trailer.



GREAT BULK of tainter gate frame is fabricated on the ground and lifted into place in one piece by the cableways. It measures 40x49 ft and weighs 29 tons

the mass concrete work scheduled for August.

On the dam, under a contract held by Chief Joseph Builders, the bridge to top the 922-ft long spillway has been fabricated on the riverside in 19 sections, each 36x49-ft, weighing 26 tons, and lifted into place by the cableway. A rolling crane will operate upon this bridge.

Wood forms for the concrete deck of the bridges are placed in each section before the lift, allowing concrete to be placed shortly after the sections reach the top of the dam. Two sections can be placed every 10 days under this program. Each section has two 36-in. outside and two 27-in. inside beams, with laterals on 7-ft 1-in. spacing.

Similarly, the 19 tainter gates are assembled on the ground and lifted into place in two sections by the two cableways. The 29-ton, 40x49-ft frame comes in one section and the 33-ton skin of 40x50-in. plates in ⅜- to ⅝-in. thickness comes in the other. Only a few welders were specially assigned to this work, others being added as work elsewhere on the project permitted. Working conditions on the ground were much safer than they would have been if the gates had been assembled in place on the dam, which has a mean height of 220 ft.

The operation required only a jig for the framework and an A-frame to lift the skin, in comparison with the elaborate staging which would have been required on the dam. Bridge sections and gates were moved in the yard by a Northwest 95 crane with 70-ft boom and carried to the cableways by a 35-ton lowboy drawn by a GMC tractor.

All normal flow of the Columbia River goes through 22 8x16-ft temporary sluices in the main dam, which will be closed by April, 1955. During the high water period of April through July, water also passes over several low blocks which will be brought up to full height between August and April, when the spring flood flow will pass over the spillway for the first time.

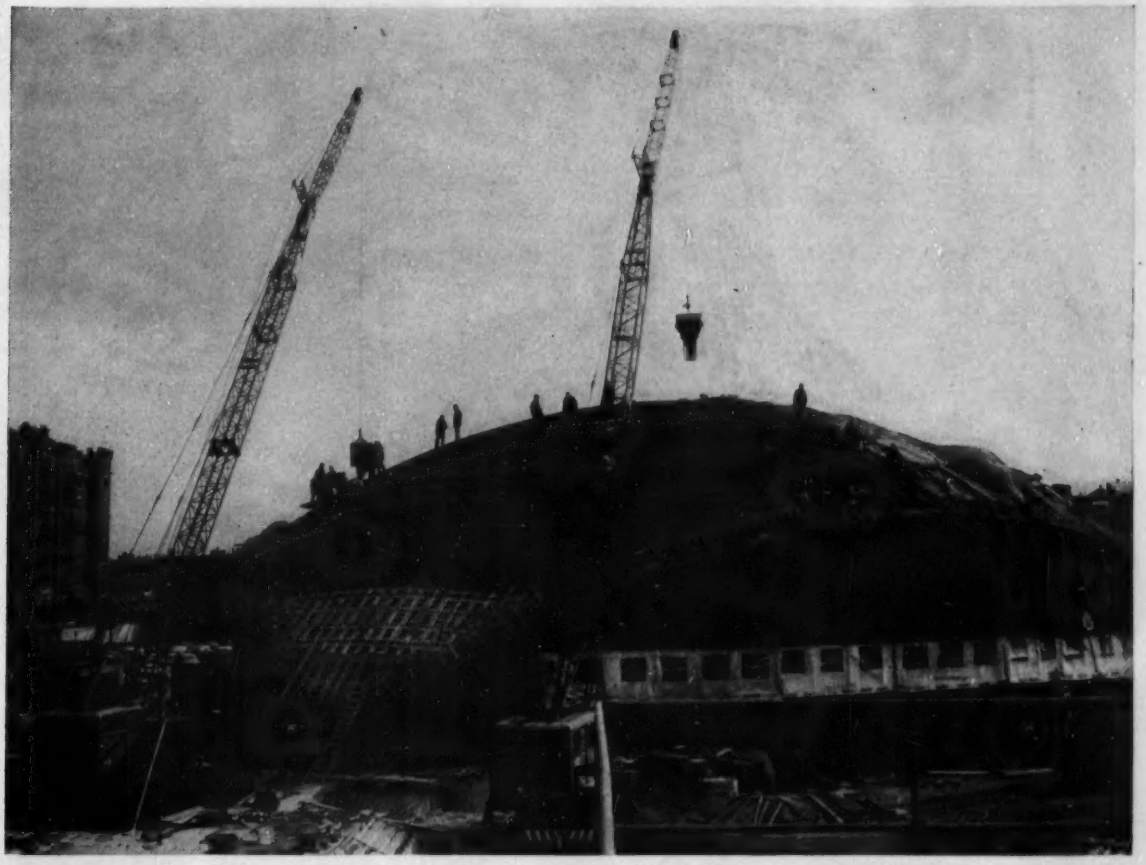
Service Next Year

Construction of the dam is expected to be completed by August 1955, and the first three 64,000-kw generators in operation by September, 1955. The initial project of 16 generators is scheduled for completion by Jan. 1, 1959. Some day, with all units installed, output will be about 1,700,000 kw.

Col. Norman A. Matthias, District Engineer for the Seattle District, Corps of Engineers, is in charge of the full $186,880,000 project, with Charles H. Wagner as resident engineer. P. J. Soukup is project manager for Columbia River Constructors and W. N. Evans for Chief Joseph Builders.

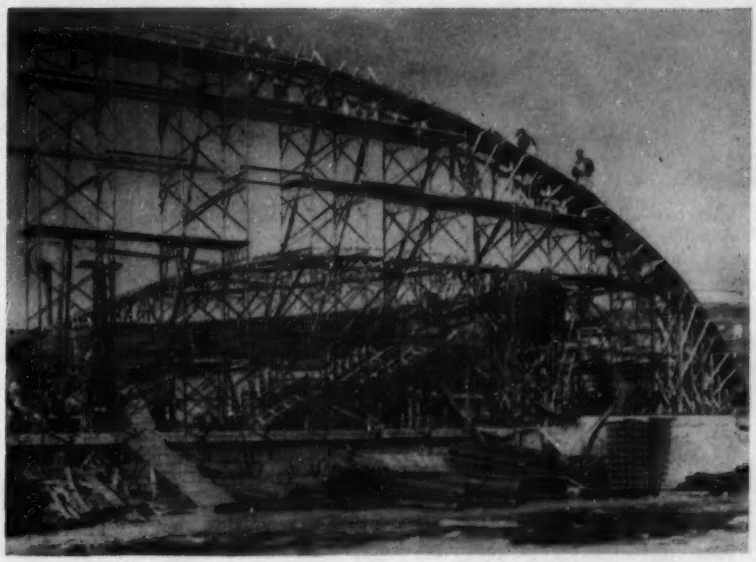
Columbia River Constructors is a joint venture combining Morrison-Knudsen Co. (sponsors), Peter Kiewit Sons' Co., General Construction Co., Henry J. Kaiser Co., Macco Corp., Walsh Construction Co., B. Perini & Sons, Puget Sound Bridge & Dredging Co. and MacDonald, Young & Nelson.

Chief Joseph Builders consists of L. E. Dixon Co., Arundel Corp., Hunkin-Conkey Construction Co. and American Pipe & Construction Co.



Few of the shores and complicated forms show, but they are key items when . . .

Small but Tricky Pour Makes Unique Dome

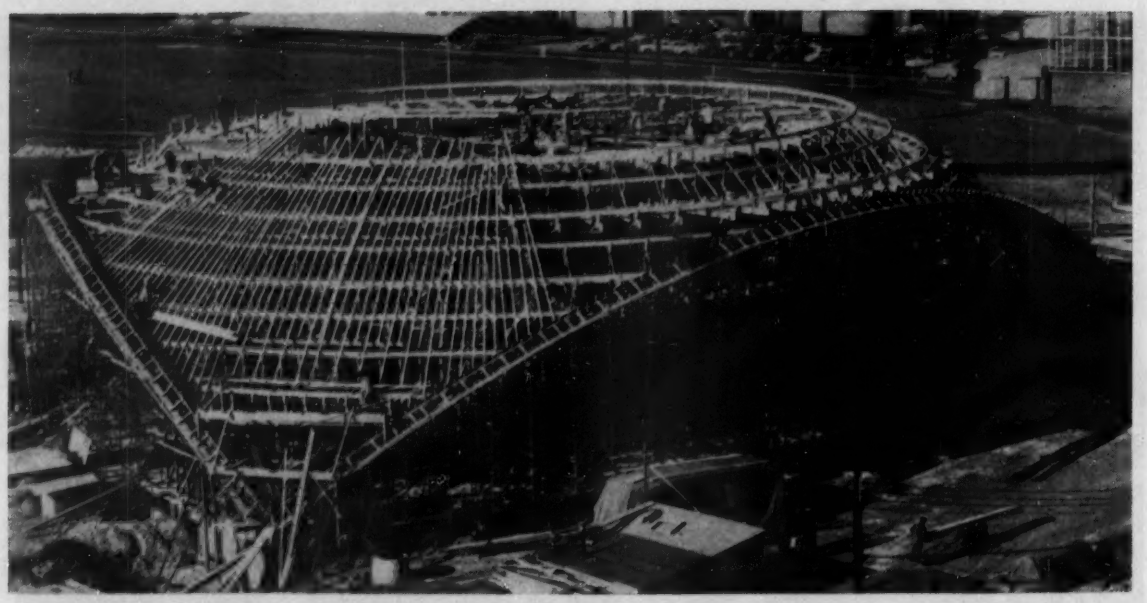


GRACEFUL AUDITORIUM at Massachusetts Institute of Technology begins to take shape as forms are erected for beam that stiffens edge of dome. Steel shoring supports wood forms.

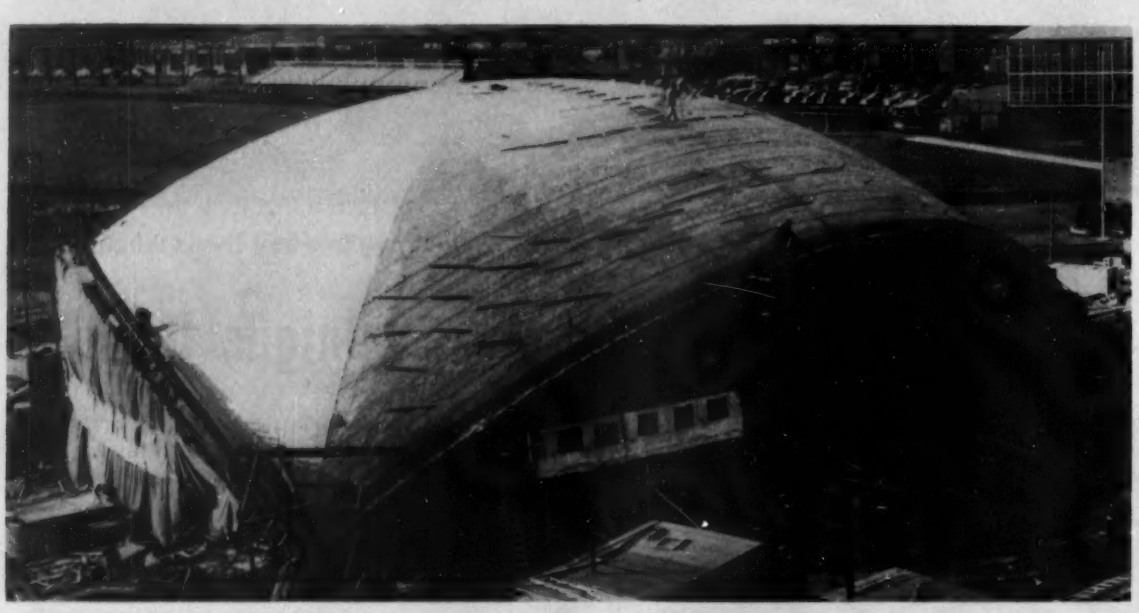
THE THIN-SHELL DOME ROOF of Massachusetts Institute of Technology's new auditorium in Cambridge called for less than 300 cu yd of concrete. But its unique shape—a segment of a 112-ft radius sphere cut so as to make an equilateral spherical triangle—made the tiny pour a tricky one. For the small yardage, contractor George A. Fuller Co. had to fabricate 60,000 fbm of lumber into 21,000 sq ft of formwork, and erect 55 tons of scaffold-type steel shoring to support it.

The spectacular dome, with a 160-ft chord length along each curved side and with a rise of 45 ft, is supported only at its three corners. Concrete shell thickness is generally 3½ in., but the dome is thickened to 5½ in. along the edges and to 24 in. at the three supports. Average over-all thickness is little more than 4¾ in.

To support formwork for this



COMPLICATED FORMS rise toward crown of dome, whose shape is an equilateral spherical triangle with chord length of 160 ft along each side and a rise of 45 ft. Form girders circling the dome on 5-ft centers are laminated triple 1x7s; form ribs are double 2x4s.



FINAL SHEATHING of form is of matched 1x7 spruce boards laid parallel to dome edges. Entire dome is formed up before first of three roof pours is made, and all forms will remain in place until all the dome concrete has reached its required compressive strength.

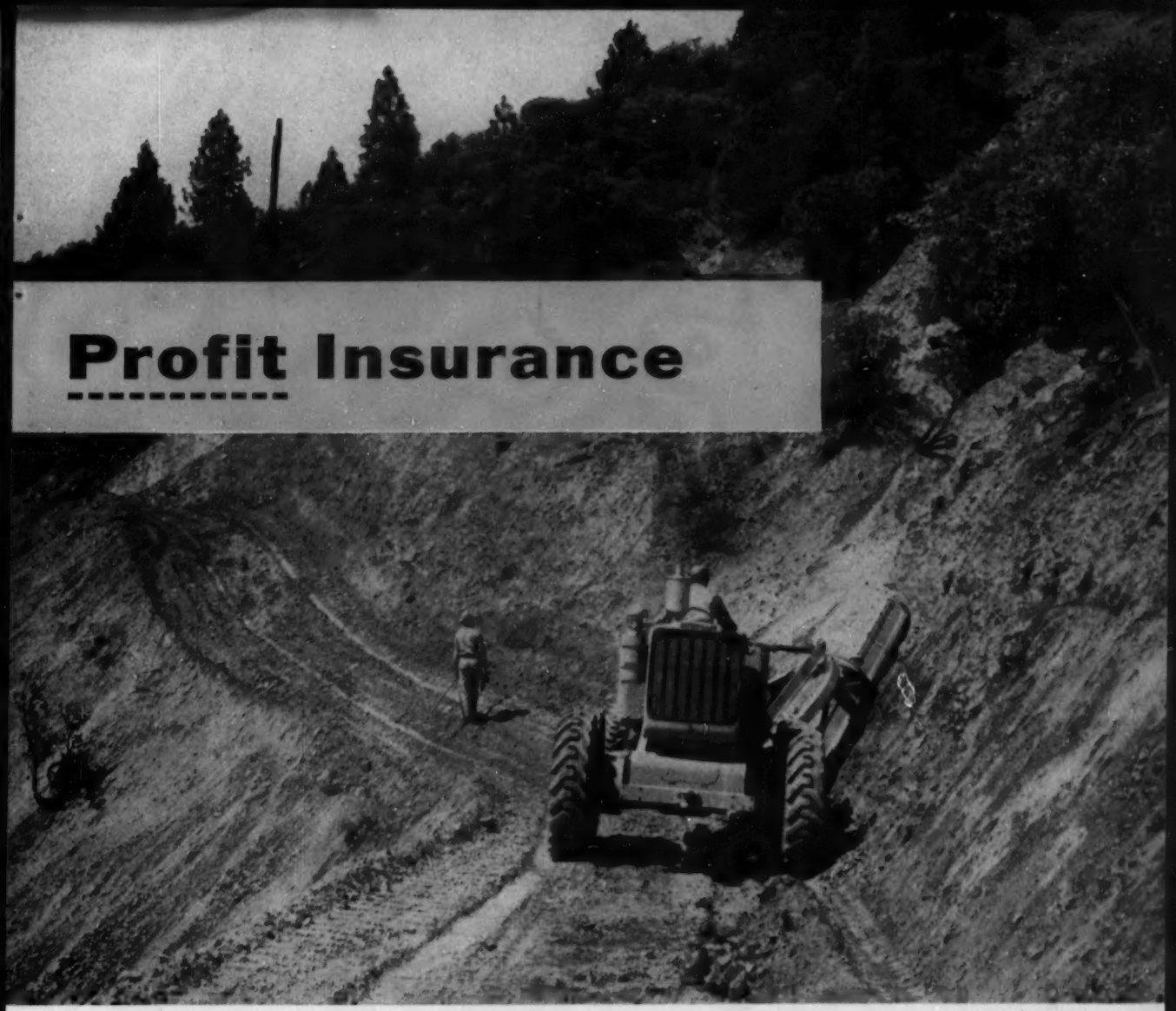
dome, more than 1,400 Trouble Saver sectional steel shoring frames with adjustable legs were erected. They were set in circular rings 5 to 7 ft apart and were braced by regular Trouble Saver diagonal struts and by Tubelox pipe-scaffolding components. This steel shoring was carried up to a common elevation above the auditorium floor, then was stepped up (by adding panels) to follow as closely as possible the curve of the dome to the crown.

For the forms, double 2x10-in. timbers on edge were set atop the shoring frames to act as sills. These carried comparatively short 3x4-in. posts, which in turn supported timber ring girders that circled the dome like parallels of latitude on 5-ft centers. Ring girders were made up of three spruce 1x7s bent to proper curvature and laminated.

The ring girders supported curved wood joists that ran up the dome like meridians of longitude. Made of double 2x4s on the flat, the joists carried 1x7-in. matched spruce sheathing boards.

All of the underside of the dome had to be formed up, of course, but exterior forms were needed only at the three corners. Here, because of the steepness of the slope (up

(Continued on page 71)



Profit Insurance

J. H. Trisdale, Inc., of Redding, Cal., was awarded the contract on this tough road-building job in Shasta County, Cal. It called for moving more than half a million yards of dirt and building an 18-foot road of crushed rock through nearly eight miles of hilly country. County-supervised, with funds supplied by the U. S. Bureau of Roads, the road will reopen to mining and recreation an area that was flooded by Shasta Lake. This Caterpillar No. 12 Motor Grader, shown bank shaping, is one of a fleet of Trisdale's Cat* machines on the job. When it comes to costs, you can count on Caterpillar equipment. These rugged, fast-working machines can be your insurance that a really tough operation stays on the profit side of the ledger.

Largest motor grader in the Caterpillar line, the No. 12 delivers a full 100 HP to the blade. You can get the *most* out of the No. 12 because of its precise balance between power, weight and working speed. Only Caterpillar Motor Graders are built entirely by a single manufacturer. There's no compromising, no "making do" with available components.

Of all the motor graders ever built by Caterpillar, 99% are still on the job! A look at the rugged construction of the No. 12 will show you why. For example, the box-section circle weighs 35 pounds per foot—the strongest circle on *any* grader!

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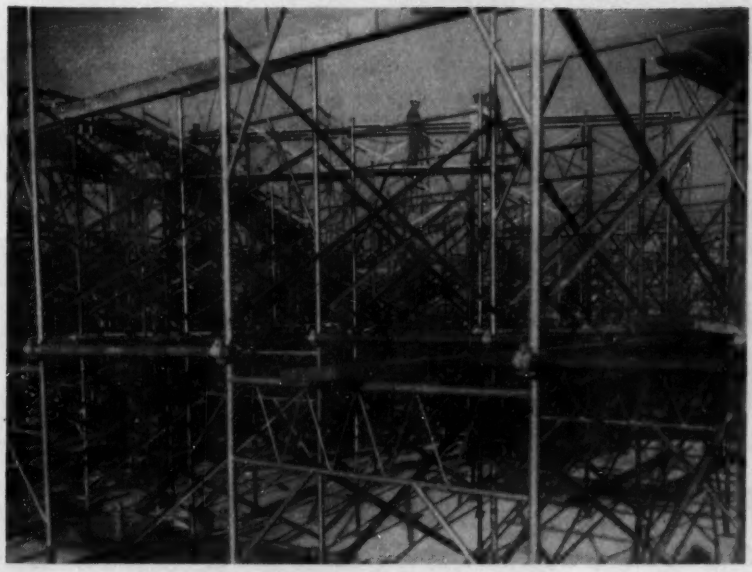
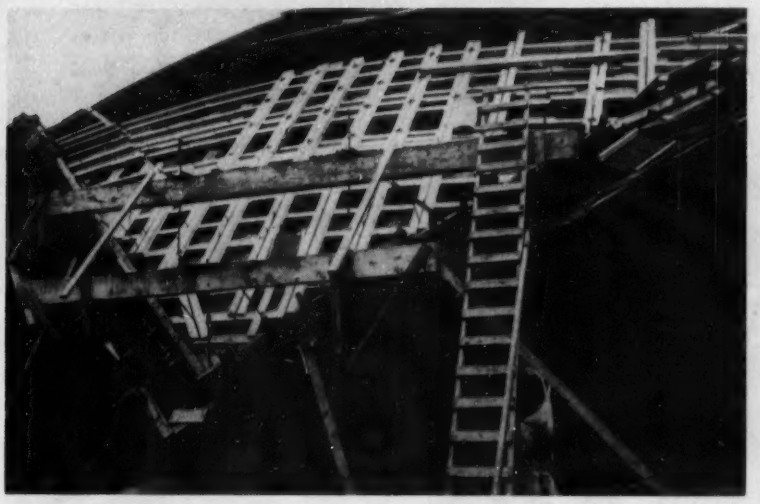


STEEL SHORING is erected on auditorium floor to support dome forms. Patent Scaffolding Co. supplied 55 tons of these adjustable-leg panel frames, braces and pipe components.



EXTERIOR FORMS are required only near dome's three supports where slope is steep. For concrete placement, alternate rows of form panels are temporarily omitted (upper photo, where one of panels rests on canvas). Later they are set and wedged to wales (lower photo).

to 54 deg), outside forms were carried to a height of 20 ft. They were held by Richmond Tyscrus incorporating a threaded rod, so could be adjusted to take care of the variable-thickness concrete in this area.

Exterior forms consisted of ⅝-in. plywood sheathing, laminated 2x4-in. horizontal studs on 18-in. centers, and double laminated 2x4 vertical walers on 24-in. centers. Alternate tiers of the 18-in. horizontal plywood panels were removable to make, in effect, continuous rows of portholes through which concrete could be poured into the form. As concrete rose, the prefitted panels were just dropped into place and wedged.

Concrete for the dome was all a 3,750-psi mix (but test cylinders averaged better than 5,000) with ¾-in. maximum size aggregate. However, the slump varied, depending on the location of the concrete on the dome. Slump was 5 in. for the double-formed lower portions, 2½ in. in a somewhat steep intermediate section above, and 3½ in. on the flatter area near the crown. This last was a 1:2:2.8 mix with 7¼ sacks of cement per yd and 5 gal of water per sack. Cement content was increased for the 5-in. slump mix.

Three Separate Pours

The entire dome was concreted in three separate 95-yd pours. Each pour was started at a corner and was carried up to the crown and the midpoint of the adjacent sides. Two P&H truck cranes handled the job, swinging buckets of transit-mix concrete from trucks to roof.

To protect the green concrete, which was placed in late winter, Fuller hung tarpaulins to close the three sides of the auditorium, and draped canvas over low supports to cover the dome pours. Four steam unit heaters within the building gave out 3,000,000 Btu per hr to keep the concrete from freezing. Some of the heat was fed out along the edges of the dome and into the space between canvas cover and concrete to maintain temperature on top of the pour at 65 deg F with an outside temperature of 35. Temperatures inside the building ranged from 85 deg at the crown to 55 at ground level.

Forms were stripped after test cylinders stored on the site indicated that all dome concrete was up to strength requirements.

On the completed structural concrete dome, 2 in. of Fiberglas in-

(Continued on page 75)

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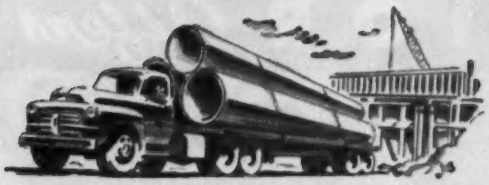

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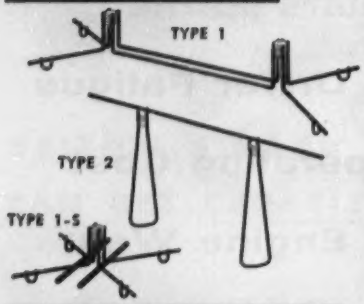

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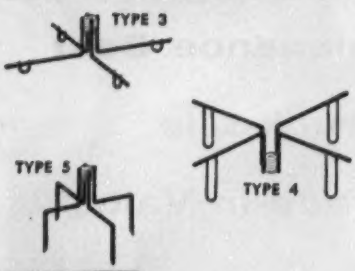

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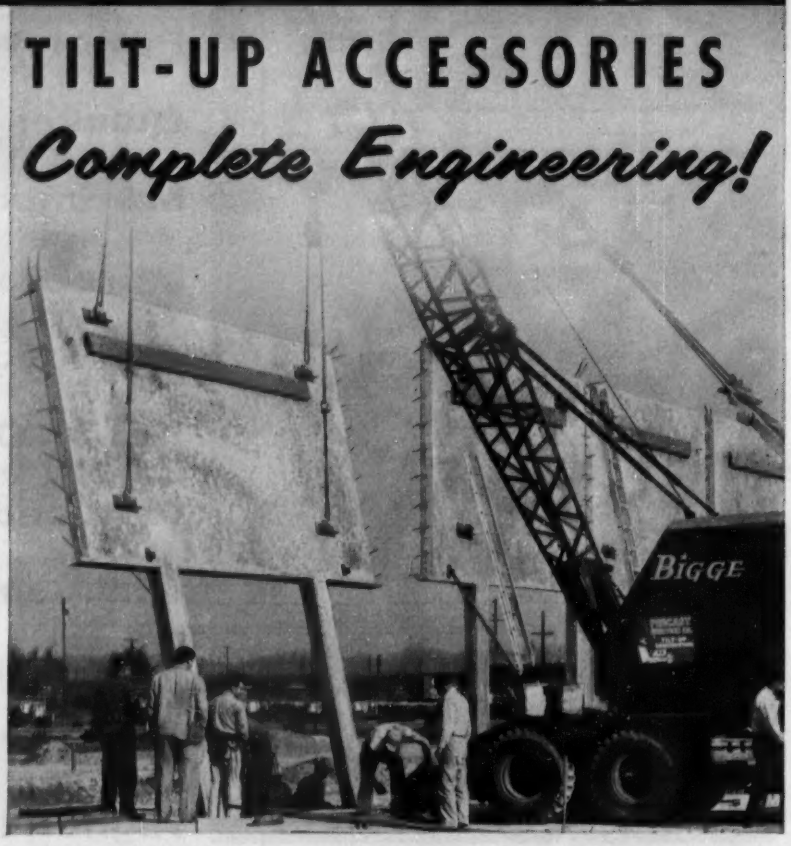

***42,000 LB. PANEL** being raised into position at United Grocers Warehouse, Fresno, Calif. Concrete panels are 8-inches thick with 12-ft. legs. SUPERIOR Pick-Up Inserts, Brace Anchors, and Braces were used. The exclusive pivoting action of the adjustable Braces permitted quick positioning and alignment of the panels. Contractor: Precast Erection Company, Niles, California.*

Tilt—Lift—Position!—The proper type of Pick-Up Inserts and Brace Anchors and their location in the slab or precast structural member is of prime importance in order to withstand the stresses occurring when *tilting*, *lifting*, and *positioning*.

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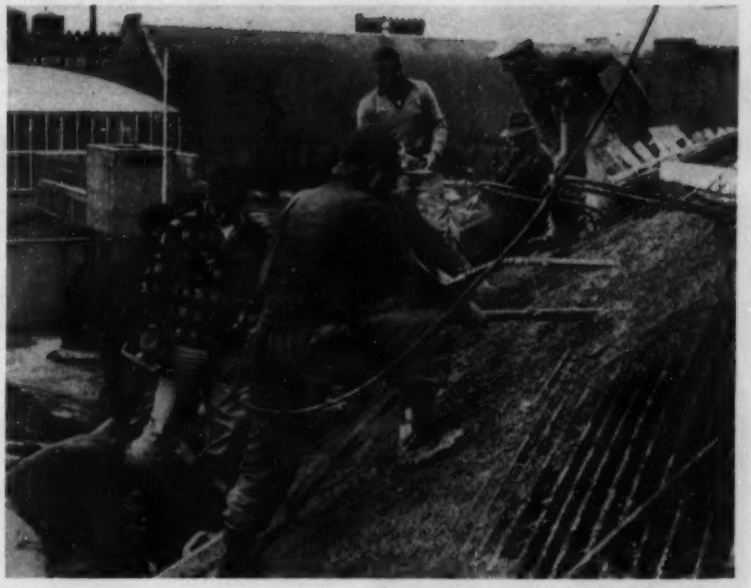
UNIQUE DOME . . . Continued from page 71

sulation is being placed and topped with a protective two-ply membrane waterproofing. This, in turn, will be covered with a 2-in. layer of poured concrete (for acoustical purposes only) reinforced with a 2x2-in. No. 14 mesh held by ¼-in. pencil rods on about 4-ft centers. A sheathing of lead-coated copper roofing will complete the unique dome job.

Project Personnel

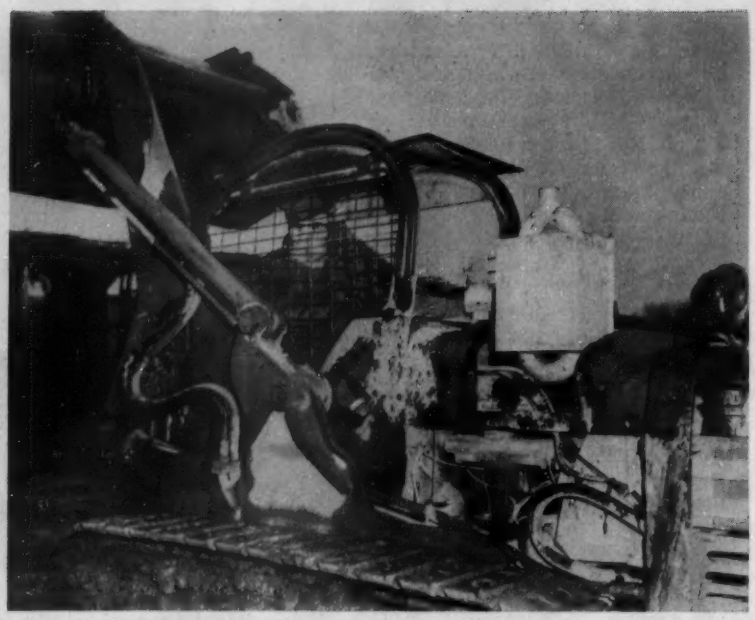
General contractor for the auditorium is George A. Fuller Co., New York. W. Douglas Bates is superintendent, Reino Laine is construction manager, and T. S. Paulsen is vice-president in Fuller's Boston office. Carl M. F. Petersen, superintendent of buildings and power, is supervising construction for MIT. Eero Saarinen, Bloomfield Hills, Mich., is architect, and Anderson & Beckwith, Boston, are associates. Consulting engineers are Ammann & Whitney, N. Y. C.



STEEP SLOPE makes concrete placement difficult, but vibrators work stiff (2½-in. slump) mix down through heavy concentration of reinforcing bars. Surface will be hand-finished.

PROTECTIVE CANVAS COVER is draped over plank staging as pour nears completion to help keep green concrete from freezing. Four steam unit heaters inside auditorium provide heat, which is confined by tarpaulins. Two P&H truck cranes are finishing up this third and final dome pour that calls for 95 cu yd of 3,750-psi transit-mix concrete. Dome used 60,000 fbm of lumber for 21,000 sq ft of forms.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY



DIESELER CATALYTIC EXHAUST was first installed on this International Lodover. It connects directly to the exhaust manifold to help eliminate exhaust fumes.

Taming of the Exhaust (Diesel)

A CATALYTIC MUFFLER, the Dieseler, which attaches directly to the diesel engine exhaust manifold and burns by catalytic action the noxious and odorous fumes in exhaust gases has been developed by Oxy-Catalyst, Inc., Wayne, Pa.

The process helps eliminate much of the heavy smoke from diesel trucks, engines, and in tunneling, permitting more widespread use of 4-cycle diesel equipment under ground.

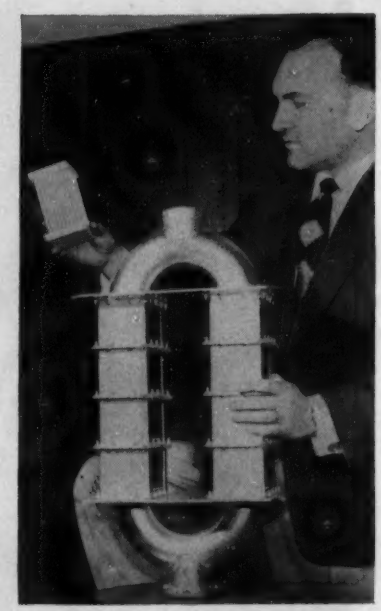
Little Back Pressure

The exhaust, installed on the front of a tractor-shovel atop the engine, connects directly to the engine exhaust manifold. It is a twin-flow, heavy-gage steel assembly containing eight catalytic sections. Over-all dimensions of this Dieseler are 7x12x27 in.

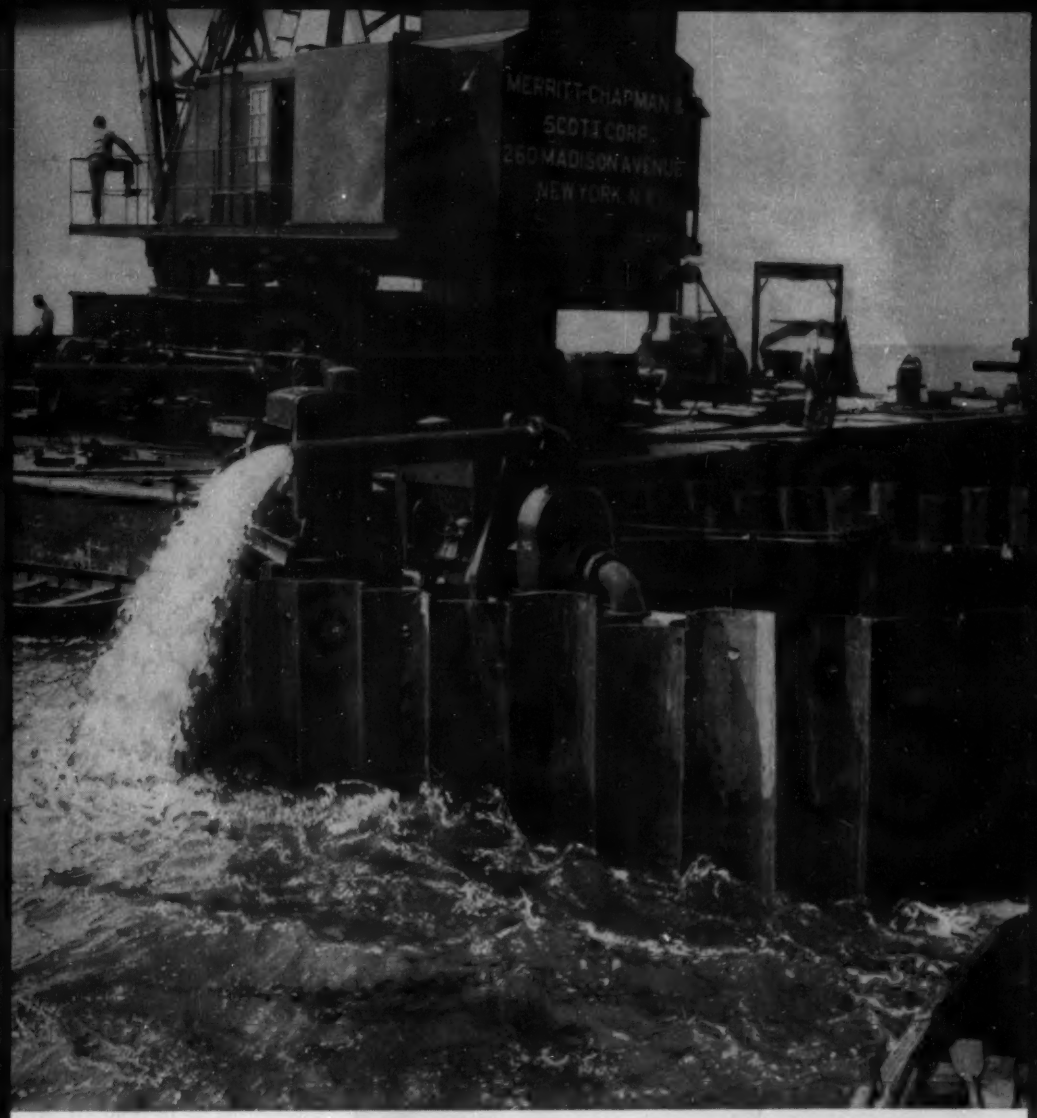
Each catalytic unit is a compact porcelain structure containing 73 slender porcelain rods that are coated with the catalytic agent—alumina and platinum alloy. As the hot engine gases flow across these rods, they are catalytically burned to carbon dioxide and water vapor. Back pressure is negligible.

In tests, it is claimed the Dieseler eliminated 65-85% of hydrocarbons, 80-90% of carbon monoxide.

It has been successfully used on a 4-cycle International Lodover in underground mining operations at the Coplay Cement Mfg. Co., Coplay, Pa., and this firm soon plans to install a similar unit on a Caterpillar D-6.



UNBURNED FUMES FLOW across the catalyst rods of the Oxycats where they are converted to carbon dioxide and vapor.

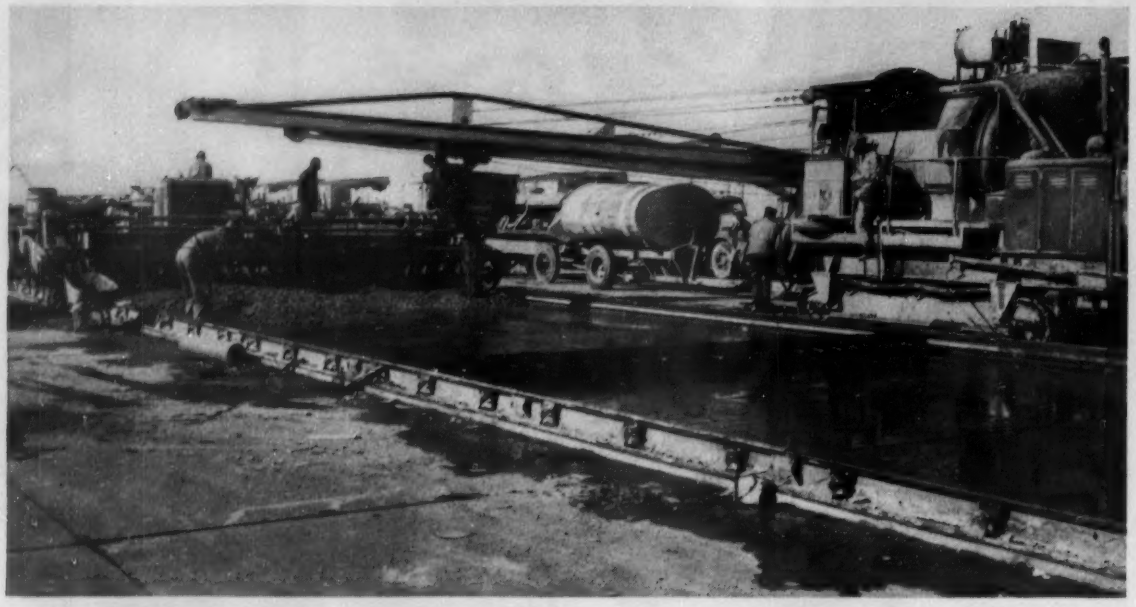


PIERS FOR THE THREE MILE BRIDGE over the Hudson River on the New York State Thruway between Nyack and Tarrytown created no problem for Merritt-Chapman & Scott Corporation of New York City. Of a total of 23 piers, 15 were built with cofferdams, two for each pier. Dependable, 8" AGC rated Marlow Self-Priming Centrifugal Contractor's Pumps were used on the job to dewater the cofferdams quickly and handle seepage water efficiently.

marlows are dependable!

Construction bids must be *right* to get the job and make a profit! Progressive operators use new methods and modern equipment to reduce costs. When it comes to pumping jobs, more and more contractors know they can depend on rugged, efficient Marlow Self-Priming Pumps or famous Marlow "Mud Hogs" to get the job done *on time* with little attention and low maintenance. See your Marlow dealer or write for Bulletin C-52.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY



APRON IS STRENGTHENED by adding another layer of concrete pavement on top of existing slab. Forms with bolted timber bases are held by pins in drilled holes in slab, as is expansion joint. Paver tows water wagon, as well as air compressor for vibrators.

Pavement Overlay Modernizes Airport Apron

BROKEN CONCRETE IS REMOVED by Bucyrus-Erie 22-B dragline from cracked section of original slab to be patched before overlay paving. Jackhammers have cut concrete up.

By WILBER A. BLAIN
Area Engineer, Fort Worth District,
Corps of Engineers

BECAUSE HEAVIER PLANES require heavier pavements, the concrete apron at Carswell Air Force Base in Texas is being given a facelifting. The Fort Worth District, Corps of Engineers, is beefing up a 403,000-sq yd area there by adding new 10- and 15-in. concrete pavements, respectively, on top of existing 10- and 6-in. concrete slabs. Intermediate-depth

ORIGINAL SURFACE IS SANDBLASTED by three Sanstorm machines to remove oil and grease spots and assure good bond between old and new concrete. Where bond is not desired, old surface is given a hot bituminous treatment by an ordinary asphalt distributor truck.

COMPOSITE FORM IS PLACED for runway extension, and same type is used for overlay paving. Bolted timbers make it right height.

CONCRETE IS PRODUCED by Ransome and Koehring 34-E pavers operating in echelon. Concrete is 5½-sack mix with 2-in. slump.

overlays make the transition from 10- to 15-in. pavements.

Since Carswell Air Force Base is in full operation, it is necessary to coordinate construction with flight operations to reduce to a minimum any delay in either. Thus, the work is scheduled in a series of seven definite sections.

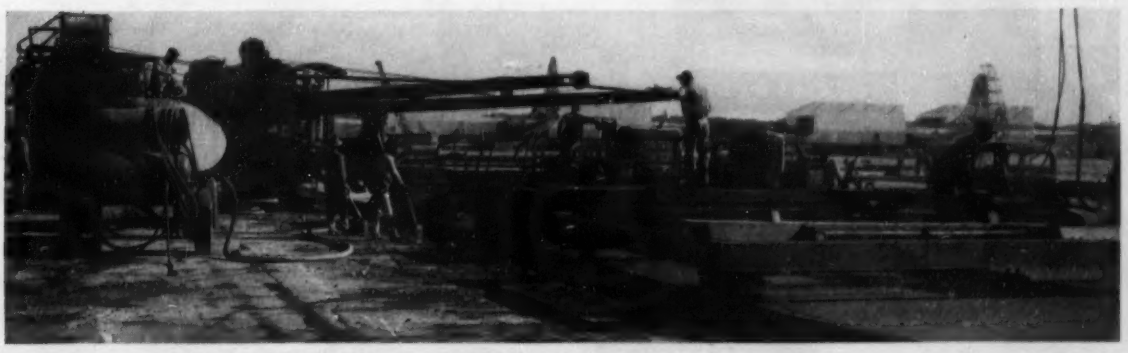
General contractor for the $1-986,000 overlay job, which calls for 132,000 cu yd of concrete over a 700x5,000-ft area, is Nolan Bros., Minneapolis. But before the firm can proceed with the final paving operations on any section, it has much preliminary work to do.

To protect the existing pavement from water in the subgrade, slabs are undersealed by pumping low-penetration asphaltic material through 1½-in. holes drilled at a maximum 12-ft spacing. Pumping operations are controlled by close observation of effects at open holes so that a positive coat of asphaltic material is deposited on the underside of the existing concrete slabs without affecting the prevailing pavement grades. Subsequent removal of pavement in various sections of the undersealed areas has shown that excellent results are obtained.

Some sections of the existing pavement had failed under loads greatly in excess of those for which they were designed. These sections are blocked out in rectangular areas coordinated with the original joint pattern, precut with concrete saws, and knocked out by heavy-duty air-operated pavement breakers. Then the exposed subgrade is recompacted to 90% of modified AASHO density by hand and mechanical tampers. In cases where the asphalt seal has been broken, the area is resealed with an asphaltic prime coat to maintain the continuous water seal. Break-outs are concreted before overlay pavement is placed. Where cracks are found in otherwise sound pavement, steel wedges are driven into them on 30-in. centers to immobilize them.

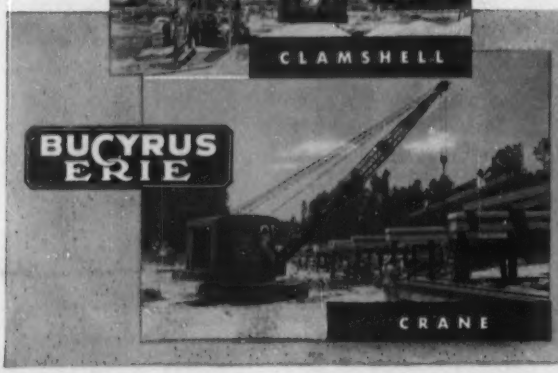
To bond old and new concrete in the 10-in. sections, the surface of the old slab is thoroughly cleaned by power brooms, then sand-blasted to remove all grease, paint and foreign material. After final flushing with clean water, the surface is kept wet continuously by water spray trucks for 24 hr prior to

(Continued on page 82)



PAVEMENT IS FINISHED by Jaeger-Lakewood transverse screed and Koehring longitudinal finishing machine that follow closely behind Jaeger concrete spreader. Hand straightedging and treatment with a burlap drag will complete the overlay finishing operations.

WHY BUCYRUS-ERIE Individual Design*



MEANS Top Performance with ANY Front End

BUCYRUS-ERIE INDIVIDUAL DESIGN provides a perfect match of excavator to rated load, regardless of which front end you use.

Whether you use your Bucyrus-Erie as a crane for setting bridge steel, as a dragshovel for trenching, or as a shovel, dragline, or clamshell for excavating or loading, you have a machine that works efficiently because it is *right* for its rating — from treads to boom point.

Because of Individual Design, you can switch front ends to meet job requirements and always be sure you'll get the consistent high output you want—along with low maintenance and long life.

See your Bucyrus-Erie distributor for the full story. He'll tell how Individual Design can cut *your* operating costs and increase *your* output.

15E54C

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

***Individual Design** means that each model is built from the ground up to handle a specific load most efficiently. There are no oversize or undersize dippers, no overpowering, no compromise in stress or safety limits simply to create "new" models. Each part is properly designed to coordinate its function with the whole machine for the greatest efficiency at the rated load.

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exclusively

Basalt Rock Co., Inc., Napa, California, engages in a wide range of industrial operations... all requiring the use of heavy power equipment. Both heavy-duty gasoline and diesel engines are operated by Basalt . . . and Shell Rotella Oil is used exclusively as the crankcase lubricant.

Basalt is just one of the many operators of heavy equipment who are getting superior lubrication and reducing costs with Shell Rotella Oil. Here are several reasons why Basalt depends on this one lubricant:

Shell Rotella Oil fights one of the chief causes of engine parts wear. It eliminates cylinder and bearing pitting caused by acid residue from incomplete combustion and low jacket temperatures.

Shell Rotella Oil gives greater over-all economy. Engine parts stay clean and operate efficiently for longer periods. Extending time between overhauls means worth-while savings in labor and parts.

If you operate heavy-duty engines, gasoline or diesel, let us show you the many benefits of using Shell Rotella Oil. *For latest information write to:*

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LUBRIPLATE DIVISION
Fiske Brothers Refining Co.
Newark 5, N. J. • Toledo 5, Ohio

PAVEMENT OVERLAID . . . Continued from page 79

CONCRETE IS VIBRATED to full depth and full width (upper photo) by battery of ten Chicago-Pneumatic units carried on rear of spreader. All vibrators are attached to one bar that is rotated by air hoist when necessary to raise them above slab, as in lower photo.

placement of concrete. Bonding of the overlay is not desired over the existing 6-in. pavement, so here a hot bituminous membrane is sprayed on before concreting.

Nolan Bros. had difficulty getting steel forms for each of the new pavement thicknesses, which varied from 10 to 15 in. But they had 8-in. Heltzel forms on hand, so built them up by bolting on timber blocking to adjust them to the required depths. The blocking, usually of 2- or 3-in. planks securely spiked together, has a base width equal to the total pavement thickness to provide stability when concrete is placed. To fasten a 10-ft section of composite form to the existing pavement, three holes slightly larger than form-pin diameter are drilled in the old concrete. A drilling templet assures correct alignment of holes, and an asphaltic cold mix makes the pins fit tightly in them. Where the original pavement is irregular, additional cold mix is tamped under the forms to give uniform bearing and prevent leakage of mortar during concreting.

Overlay is paved in 25-ft widths, with an average straight run of only 1,700 ft. Concrete is a 5½-sack mix with a minimum 28-day flexural strength of 650 psi and a maximum 2-in. slump that is mixed in two 34-E pavers (one Koehring and one Ransome) operating in echelon. Enough Protex admixture to entrain up to 3% air is added to the dry-batch aggregate and

cement at the pavers. Water is supplied to both pavers by a 2,500-gal tank trailer drawn by one of them.

Concrete is distributed across the 25-ft lane by a Jaeger mechanical spreader. This machine is fitted with a battery of ten Chicago Pneumatic vibrators operating from a horizontal support member at the rear. The support is arranged so that all of the 3-in. air-operated vibrators can be lifted above the concrete when the spreader stops its forward motion. A Gardner-Denver 500-cfm compressor, coupled to the pavers' water-supply trailer, supplies air for their operation.

Spreading is followed closely by two passes of a Jaeger-Lakewood transverse finishing machine fitted with two screeds for striking off the concrete to approximately design grades. A Koehring longitudinal floating machine gives the surface a final tamping, with each floated section overlapping the preceding one by at least 5 ft.

After mechanical finishing, long-handled metal straightedges remove all excess concrete, laitance and undesirable matter. Tests are made with a 10-ft straightedge to locate any observable departures from the ⅛-in. tolerance, which are then hand-finished.

Moist Burlap Drag

Initially, surfaces were smoothed with short transverse strokes of a two-ply fabric belt. The belting operation tended to leave disfiguring marks on the surface, however, so a fine burlap drag finish is now being employed. The drag is formed by draping four folds of burlap from a movable bridge riding the forms. At least 1 ft of the lower fold is in constant contact with the concrete surface, and depth of finish is varied by weighting the drag with light boards. The burlap, washed at intervals to keep it clean, is kept moist during the dragging operation.

Completed pavement is cured with a Servicised white compound. The membrane is applied as soon as practicable after the finishing operation by a Flex-Plane machine which rides on the forms. A motor-driven chain arrangement drives the spray jets back and forth across the paving lane at a height of 8 to 15 in. above the surface, and a wind guard shields them.

Joints in the overlay pavement fall directly over corresponding joints in the original apron. Trans-

(Continued on page 86)

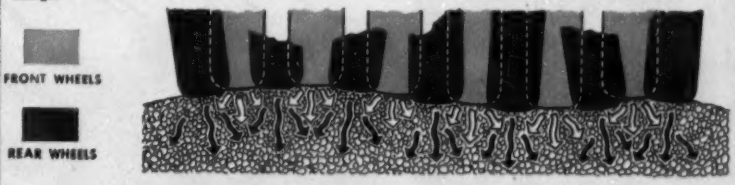
BROS tip sheet

EQUIPMENT NEWS FROM A FAMOUS NAME IN ROAD MACHINERY

COSTLY EXTRA PASSES ELIMINATED WITH "WIDE TIRE" COMPACTION ROLLERS BY BROS

Look below and see how the world-famous Bros Wobble-Wheel design (patented and copyrighted) works. Added to the regular up-and-down oscillating motion is a side-to-side weaving, kneading motion of each wheel, that aids compaction. You can get Bros rollers with this design or oscillating Straight-Wheel design.

No more lines, ridges or marks! New Bros pneumatic tire rollers give you full coverage of every surface contour on *every pass!* Now you can use the same roller for seal-coat rolling as well as rough base compaction. New design of Bros kingpin makes drawbar hookups easier, at any height. Three models—7, 9 and 13-ton capacities.



CHOOSE A TAMPER THAT'S READY FOR ROUGH AND TOUGH COMPACTION WORK

A sheepfoot tamping roller is one thing you don't want to waste time on. Therefore, get tampers that are built to last, like the Bros medium-weight "M" series. These tampers have a heavy outer shell and integral steel axle connected by welded end plates. Self-aligning bearings. Frame is encircling box type, very strong. Specify the *toughest*—specify Bros!

Bros "M" Series sheepfoot tampers come in 1, 2 and 3 drum models. Choice of 5½ or 7 sq. in. foot surface areas. Ft. psi range from 108 lbs. to 315 lbs. Extra drawbar for tandem work.

"Quickies" for your information

Don't be caught with "orphan" compaction equipment. Remember that Bros is the world's largest manufacturer of pneumatic tire rollers.

Bros originated and patented the giant 50-ton rubber-tire Roll-O-Pactor, widely used on the big jobs.*

Giant-weight Bros "G" Series tamping rollers range in ft. psi from 260 to 738 lbs.

Bros also makes "special" types of tamper and smooth drum rollers, to order. Let us quote you.

Road Machinery Division, **WM. BROS BOILER & MFG. CO.**

1191 Tenth Avenue S. E. • Minneapolis 14, Minnesota

To get specifications and data on any of the Bros compaction products listed below, just check the items which interest you and send us this slip, along with your name, company or organization and address.

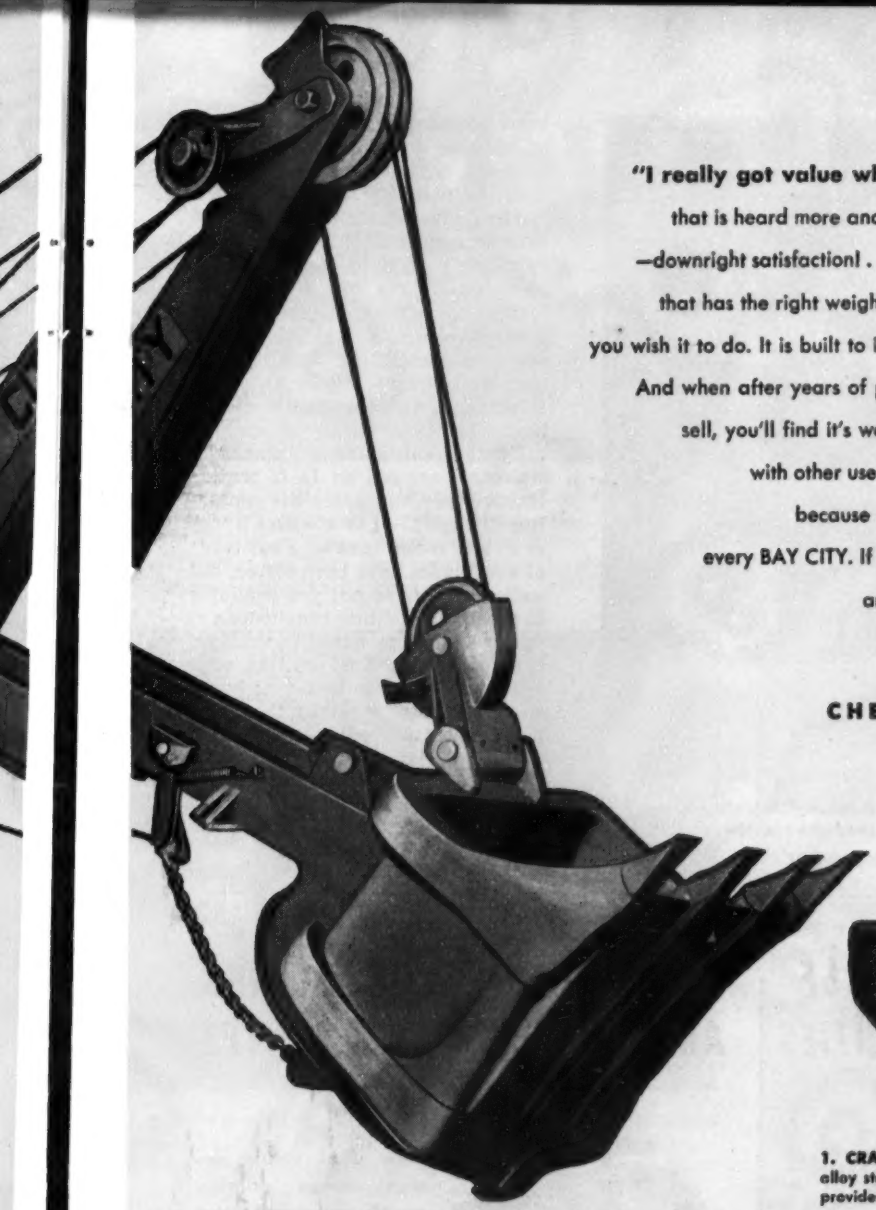
- ☐ Bros 35 and 50-ton Roll-O-Pactors*
- ☐ Special Airborne Roll-O-Pactors*
- ☐ Bros 7, 9 and 13-ton Pneumatic Tire Rollers
- ☐ Giant weight Bros "G" Series Tamping Rollers
- ☐ Medium weight Bros Series "M" Tamping Rollers
- ☐ Bros smooth drum rollers

Best value when you buy! Worth more when you trade or sell!

Illustrations are of the heavy-duty ¾ yard BAY CITY. Other crawler models in ½ and 1½ yard capacity.

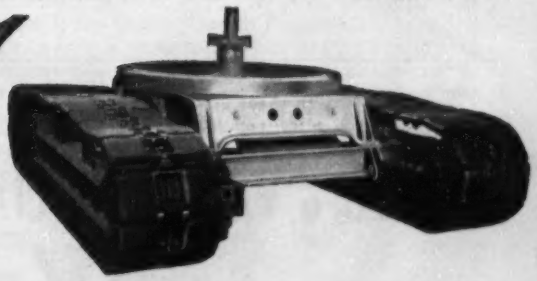
BAY CITY

BAY CITY SHOVELS, INC., BAY CITY, MICH. • SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

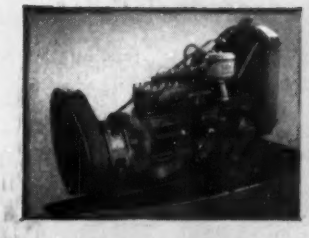


"I really got value when I bought that BAY CITY!" is a sentence that is heard more and more from BAY CITY owners. It means one thing —downright satisfaction! . . . and even on the toughest jobs. Here is a shovel that has the right weight, power, stability, and balance for whatever job you wish it to do. It is built to insure years of steady, dependable performance. And when after years of profit-producing work you are ready to trade or sell, you'll find it's worth more then, too. Yes, even sitting in the yard with other used machines it still commands a higher price. That's because there's extra value . . . extra quality built into every BAY CITY. If you want a machine that will out-work, out-earn, and out-live any other crawler, buy the BAY CITY.

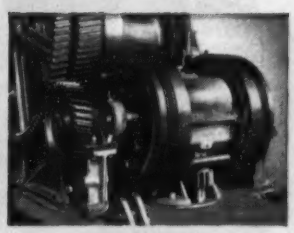
CHECK THESE WANTED FEATURES THAT YOU GET IN THE BAY CITY



1. CRAWLER MOUNTING with long, wide crawlers, unit cast alloy steel base, sturdy center post and large diameter roller path provides firm foundation.



2. BIG ENGINE, gas or diesel, mounted directly on cast rotating base . . . large displacement and slow R.P.M. gives added torque.



3. POWERFUL SWINGERS of the internal two-shoe type with large, heavy iron drums provide smooth operation, best heat dissipation and wear resistance.

4. BOOSTER CLUTCHES for drums are set by mechanical linkage to assure accurate load control and easy operation with minimum maintenance.

5. POWER DIPPER TRIP makes quick, effortless dumping of bucket possible. Trip is actuated by push button on top of swing lever . . . no lost motion.

6. TANDEM DRUMS mounted in ball-bearings permit straight cable lead and big cable capacity.

7. HELICAL GEARS give long life and quiet, smooth operation because of gliding contact.

8. UNIT CAST REVOLVING TABLE provides firm base for all machinery, engine and boom-foot lugs.

9. WORM BOOM HOIST (standard or independent) is safe and accurate because it raises or lowers by power only.

10. OPERATING CONTROLS are all within easy reach of the adjustable operator's seat.

11. CRAWLER ADJUSTMENT is quick and easy through compression bolts in grease filled pockets.

12. MANEUVERABILITY is assured by differential drive permitting sharp or gradual turns while travelling.

13. CONVERTIBILITY to shovel, crane, clamshell, dragline or hoe is possible with minimum effort.

Write for this catalog describing BAY CITY Crawlers of ½ yard and up. Catalogs also available on BAY CITY CraneMobiles and CraneWagons in capacities to 25 tons.

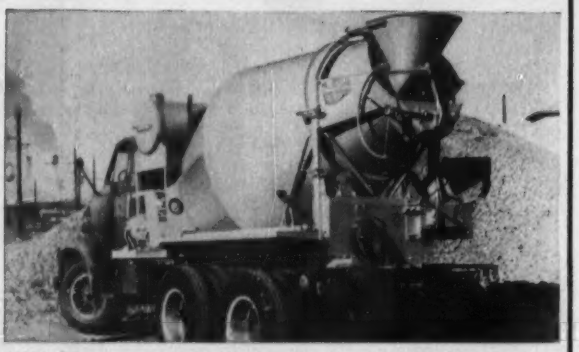
JOINTS ARE CUT by Clipper concrete saws. Transverse contraction joints are sawed on 15-ft centers, and a longitudinal construction joint is sawed down center of 25-ft lane.

verse expansion joints are pre-set in position on 200-ft centers, and concrete is placed on each side of them by hand ahead of the paver. A steel-channel support, which in turn is supported by longitudinal brackets pinned to the old pavement, holds the top of the preformed joint filler in place. After new pavement straightedging has been completed, the steel channel and its brackets are removed for future use, and the filler material is checked for accuracy of position.

Contraction joints or planes of weakness are cut on 15-ft centers transversely and along the centerline of each 25-ft lane with Clipper or Felker concrete saws. Four types of saw blades have been tested, but sufficient data is not yet available to reach any definite conclusions as to the relative merits of the various types. The diamond cutting edge appears to operate better on hardened concrete, whereas the composition cutting edge seems to do better on relatively green concrete. Composition-edged blades cut a ¼-

(Continued on page 89)

TRANSCRETE AVAILABLE IN 3 TO 6 YARD CAPACITIES



CMC's Transcrete — the simplest truck mixer of all — features the famous "Thoro-Mix" action that charges, mixes, and discharges all slumps faster.

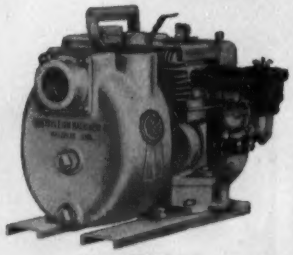
Large drum diameter, deep "L" section blades and a progressively increasing blade slope are drum design features that make for more thorough mixing, more positive discharge, and a greater ability to handle stiff, low slump mixes.

Transcrete's time saving efficiency means more trips per day as mixer or agitator.

Quality construction and simplified rugged design assure trouble-free life.

Transcrete offers you the choice of a profit making size at the price you want to pay.

CMC DUAL PRIME PUMPS ARE LIGHTER WEIGHT YET LONGER LIVED



4M — 4000 G.P.H.

New dual volute design makes priming rapid, automatic and dependable. Unipacked shaft seal is protected by rapidly spinning liquid screen. Fewer parts — easier to service.

ALL SIZES

Built in all pipe sizes 1½" through 4". Other CMC Dual Primers in 6", 8" and 10" sizes with capacities to 240,000 G.P.H. Larger pumps have water cooled engines — gasoline or diesel. Also full line of electric pumps and pumps for belt drive.

40M — 40,000 G.P.H.

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CONSTRUCTION MACHINERY COMPANIES . . . . . WATERLOO, IOWA

where schedules are tight and time is money, it's

ALEMITE "ON-THE-JOB" LUBRICATION

1. **SAVES TIME!** By bringing clean, fresh lubricant right to the machines . . . where you need it, when you need it.

2. **SAVES MONEY!** By cutting expensive lubrication down-time—increasing output of both men and machines.

3. **SAVES EQUIPMENT!** By helping protect vital bearings against costly wear and time-consuming breakdowns.

• The sheaves of this power shovel get a shot of clean new lubricant. The operator is using Alemite Hand Gun 1056-SE. This lever type gun has plenty of power to push out old grease and dirt—has large capacity to service many bearings without refilling.

• Here the Alemite Hand Gun is refilled quickly with Alemite Loader Pump 7181-L. Just eight strokes of the pump fills the gun with no mess, no waste, no troublesome air pockets. Lubricant is protected at all times from dust, dirt and grit that can ruin bearings.

• Here an Alemite Tractor Bucket Pump 6521-B gives the positive lubrication protection demanded by bearings of track support rollers against dirt and grit. Engineered to provide both high pressure and volume delivery, this pump has become the standard of the industry.

• Turntable bearings are serviced with Alemite Red-A Bucket Pump 7137-A. This pump has large capacity for bearings that require high volume. At the top of the pump is Alemite Dyn-O-Mite Gun 7132 that supplies up to 10,000 pounds pressure with easy one-hand squeeze.

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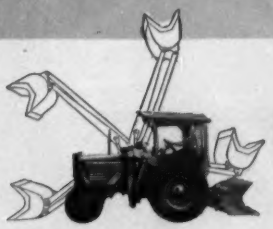


OLIVER DIESEL AND STRAIT-LINE LOADER!

With this bulldozer attachment the Strait-Line becomes even more profitable. Rear-carried bucket adds traction that makes heavy dozing easy. Blade does not interfere with loader operation. Other attachments include lifting boom, fork, and a variety of buckets from ¾- to 2-yd. capacity.

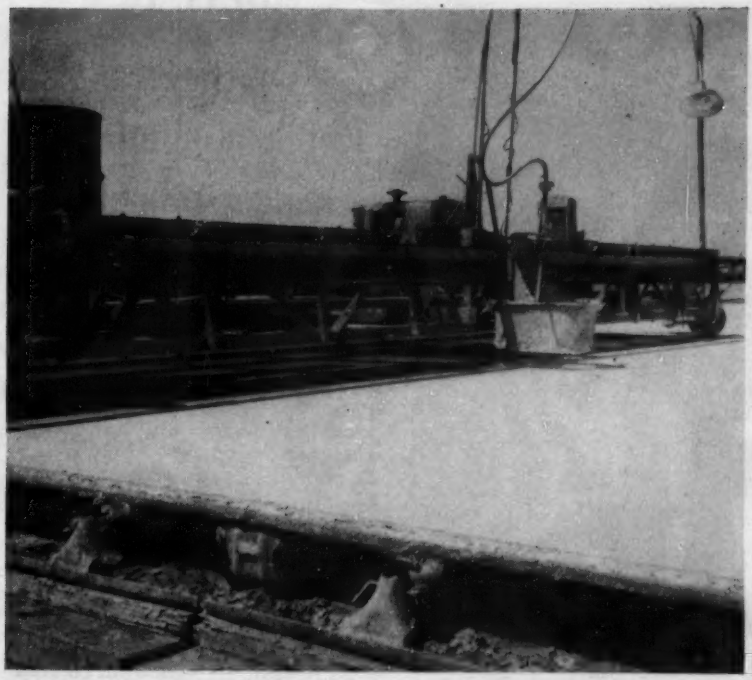
Diesel economy and short-cycle loading—that's how the Oliver diesel tractor and Strait-Line loader short-cut to more profit on any loading job. Compare this unit with other loaders... it digs in *front* or *rear* and loads in front... always working in a straight line. The rear-carried bucket increases traction, makes steering easier and permits bigger loads.

Now add the ruggedness and economy of either the Oliver "77" or "88" diesel tractor. Here is a 6-cylinder diesel you can count on for quick starts and down-right lugging ability to do more work at less cost. Get acquainted with this unit by driving it yourself. Check its features and you'll see why you get more yardage at a lower cost with an Oliver diesel and Strait-Line loader. See your Oliver Industrial Distributor.

THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors



PAVEMENT IS CURED with Servicised white-pigmented compound sprayed by Flex-Plane machine. Specs call for concrete to be cured for 7 days, so membrane process is used.

in. joint to the full depth (which is equal to either the thickness of the pavement divided by 6, or else the diameter of the maximum aggregate, 2½ in., whichever is greater). Diamond-type cutting edges have been ⅛- and ¼-in. widths, and also a double blade which cuts both a ¼-in. width for the top ¾ in. of joint depth and a ⅛-in. width below. The ⅛-in. blade requires an additional cut to enlarge the top ¾ in. of joint to a ¼-in. width to provide sufficient joint sealer at the pavement surface. It has been found advisable to cut dummy joints at 50-ft intervals within 24 hr after placement of the concrete: the intermediate joints can be cut within 7 days.

Initially, joints were filled directly by a standard pouring ladle. But Nolan had difficulty in filling the ¼-in. joints by this method without a substantial waste of the joint compound. Now, a Clipper double kettle with pressure attachments is being used. The heated

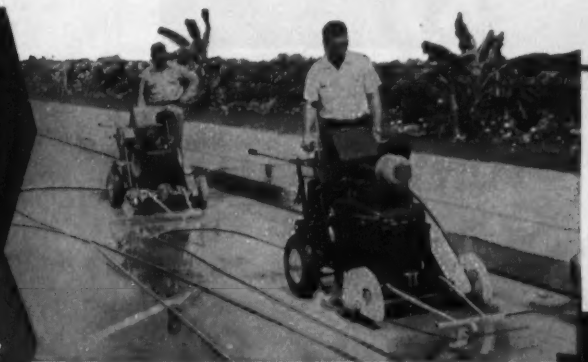
(Continued on page 91)

FELKER DI-MET MODEL 252

CUTS MORE FEET PER DAY!

LENGTHENS BLADE LIFE!

LOWER COST-PER-CUT!



MAKES MORE FOOTAGE PER DAY. Model 252 is SELF-PROPELLED! Cuts faster, requires no tiresome pushing on long straight-a-way-cuts! Eliminates frequent rest periods and loss of footage!

DIAMOND BLADES LAST LONGER — Smooth, uniform travel eliminates sudden bumps, jolts, side deflections and similar causes of diamond wheel damage. Field reports show up to *DOUBLE* the life from your diamond wheels!

HUSKY, SELF-STARTING 13.5 HORSEPOWER ENGINE — Standard equipment. Also available with 26 h.p. engine (illustrated) for deep cutting with large wheel sizes. CUTS 7 INCHES DEEP with 18" blade! Uses any blade diameter between 10" and 18".

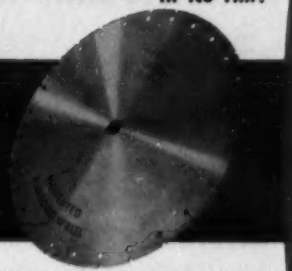
RIGHT OR LEFT HAND OPERATION — Spindle uses diamond wheel on either end.

HYDRAULIC LOWERING AND RAISING MECHANISM eases blade into and out of cut, minimizes blade shock.

WORKS CLOSE TO WALLS, CURBS, ETC. Special hinged blade guard lifts up, exposes wheel for close-up jobs.

Other concrete cutter models available. Ask for literature or see your local DI-MET dealer!

DI-MET
SEGMENTED TYPE
the DIAMOND BLADE with MORE FOOTAGE in its rim!



Built in a wide range of bond variations to deliver *peak performance* on your individual job! The right bond means longer life, lower cost-per-cut! Specify DI-MET Segmented Type.

FELKER MANUFACTURING CO.
TORRANCE, CALIFORNIA

WORLD'S LARGEST AND OLDEST MANUFACTURER OF DIAMOND ABRASIVE CUT-OFF WHEELS AND MACHINES

NEW LINCOLN PLANT CREATED BY INCENTIVE INSPIRED CO ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

©LE Co 1954

Erecting shop-fabricated half-sections to form 134′ trusses by arc welding.

ELIMINATES 73 TONS OF STEEL

... Simplifies Construction

WELDED design for this hangar was bid at $449,018.00. Riveted design was quoted at $451,110.00.

Even though the structure was originally designed for riveting, the welding alternate used 5% less steel... saved $2,092.00 on construction costs.

SAVINGS LIKE THESE *and more,* can be realized on *all* types of structures when welded design is properly used. For additional data on welded structural design, send for "Lincoln Studies in Structural Arc Welding." Write

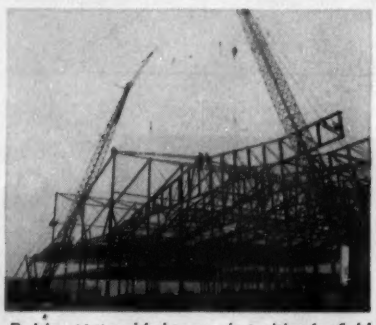
Welded Cantilevers 134′ long eliminate hanger columns

At New York International Airport, welded steel hangar cantilever trusses extend 134′ on either side of center frame.

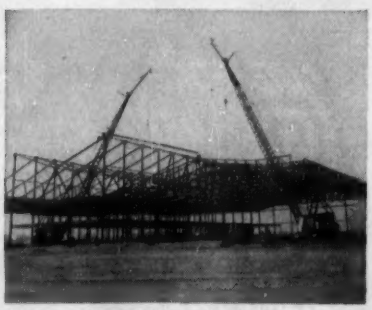
Structural weight of *supporting* steel on this airport hangar weighs but 20 pounds per square foot. A comparative structure using bow string trusses spanning 140′ would weigh 21 pounds per square foot.

In addition to savings in steel, construction costs are further reduced by simpler finishing, less perimeter wall, etc.

Shop fabricated trusses were shipped in half sections, field assembled and hoisted by two traveler cranes. Each truss rests on 85′ ties from column 44′ above the roof.



Raising 134′ welded trusses in position for field erection by arc welding.



1294 ton welded framework at Idlewild Airport. Designed to house 5 large and 3 small transports. Designed by Port of New York Authority. Fabricators and Erectors, Lehigh Structural Steel Company.

THE LINCOLN ELECTRIC COMPANY

DEPT. 2703 • CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

JOINTS ARE FILLED under pressure with Para-Plastic jet-fuel-resistant sealing compound. Material is heated in double-boiler kettle (right) and placed through narrow snorkel nozzle that fits in ¼-in. joint.

joint material is introduced into the joint by a "snorkel" under pressure. The snorkel has a slit that fits into the sawed joints for sufficient depth to fill them completely and prevent overflow on to other portions of the pavement.

General contractor for the overlay job at Carswell Air Force Base is Nolan Bros. Inc., Minneapolis, for whom W. L. Nolan is project manager and Basil Cowan is superintendent. The project comes under the Fort Worth District, Corps of Engineers. Col. H. R. Hallock is district engineer, and the author is area engineer for the project.

Biggest Crawler Being Tested

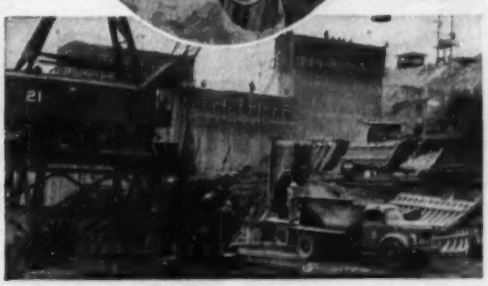
JUST BEFORE GOING to press, CM&E learned that the Caterpillar Tractor Co. has on widely scattered jobs put to work several of the huge D9 crawlers on which the company has been working for five years. They are experimental machines, and few specs are available. The bare tractor weighs 51,500 lb; it is 18 ft long, 12 ft wide and 10 ft high. Horsepower of the engine is not announced. Oil clutches and torque converters both are being tested on these D9Xs.

T.V.A. HAULS MASS CONCRETE 8 Miles In DUMPCRETES...

Top quality and uniform concrete is delivered to Ft. Patrick Henry Dam in Tennessee after 8-mile haul in non-agitating units. Of the 75,000 yards of air-entrained concrete, about ⅔ contains 6" aggregate. Ten Dumpcretes haul 4.4 cu. yds. per load—about 600 yds. per 7½ hour shift! TVA now uses 30 high-speed rugged Dumpcretes on this and five other projects. Write today for complete report on this job.

6" aggregate concrete uniform and with no segregation

Plant located 8 miles from pour



Dumpcrete's vertical dumping angle assures fast, clean discharge

MAXON DUMPCRETE

FASTEST FROM PLANT TO POUR

Manufacturing Division, Maxon Construction Co., Inc.
699 Talbott Building, Dayton 2, Ohio

Send the following literature:

☐ Field Report - Ft. Patrick Henry Dam ☐ How the Dumpcrete Hauls 8 Different Materials

Name_____

Firm_____

Street_____

City_____

a full bucket every bite

You can't make money with an empty bucket! SHOVELOADER fills the bucket every time.

First—it gives you power downcrowd to the amazing depth of 25 inches. Second, you can tilt the bucket back as much as 30 degrees at ground level. This combination means natural "ground-breaking" digging action—faster excavating or stripping—and, profitable *full* bucket operation.

SHOVELOADER bucket is *wide*, wider than wheel treads. You can dig right up to the curbs or walls, making clean-up jobs easy. The tractor follows, without climbing, wherever the bucket can dig.

With lifting height of 10′ 10″ SHOVELOADER easily loads the highest truck. Long forward reach permits spotting loads in center of truck body. Long 100-inch wheelbase assures stability when digging, lifting or carrying loads.

Other exclusive built-in features increase utility by improved rough-terrain operation, greater operator safety, mobility, and longer life.

Standard 1½ yard bucket is interchangeable with 1¼ yard or 2½ yard sizes, also forks, lifting crane, backfill blade, bulldozer or snow plow. Write for 8-page descriptive bulletin. The BAKER-LULL Corporation, 355 West 90th Street, Minneapolis 20, Minn.

THE BAKER-LULL CORPORATION,
355 West 90th Street • Minneapolis 20, Minn.

Please send 8-page illustrated specification bulletin AD-55 on your 4-Wheel Drive SHOVELOADER

NAME.....

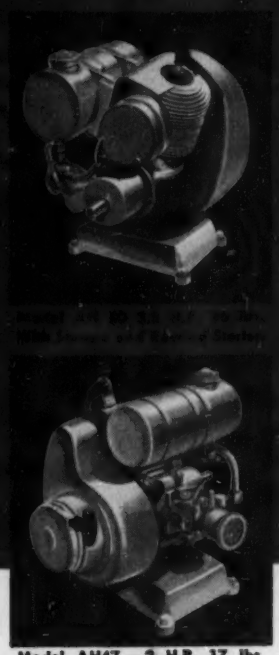
COMPANY.....

ADDRESS.....

CITY.....STATE.....

Baker Lull
handling equipment

SHOVELOADER



Model AH47 — 2 H.P. 17 lbs.
With Shroud and Rewind Starter.

POWER PRODUCTS ANNOUNCES

a new line of industrial engines

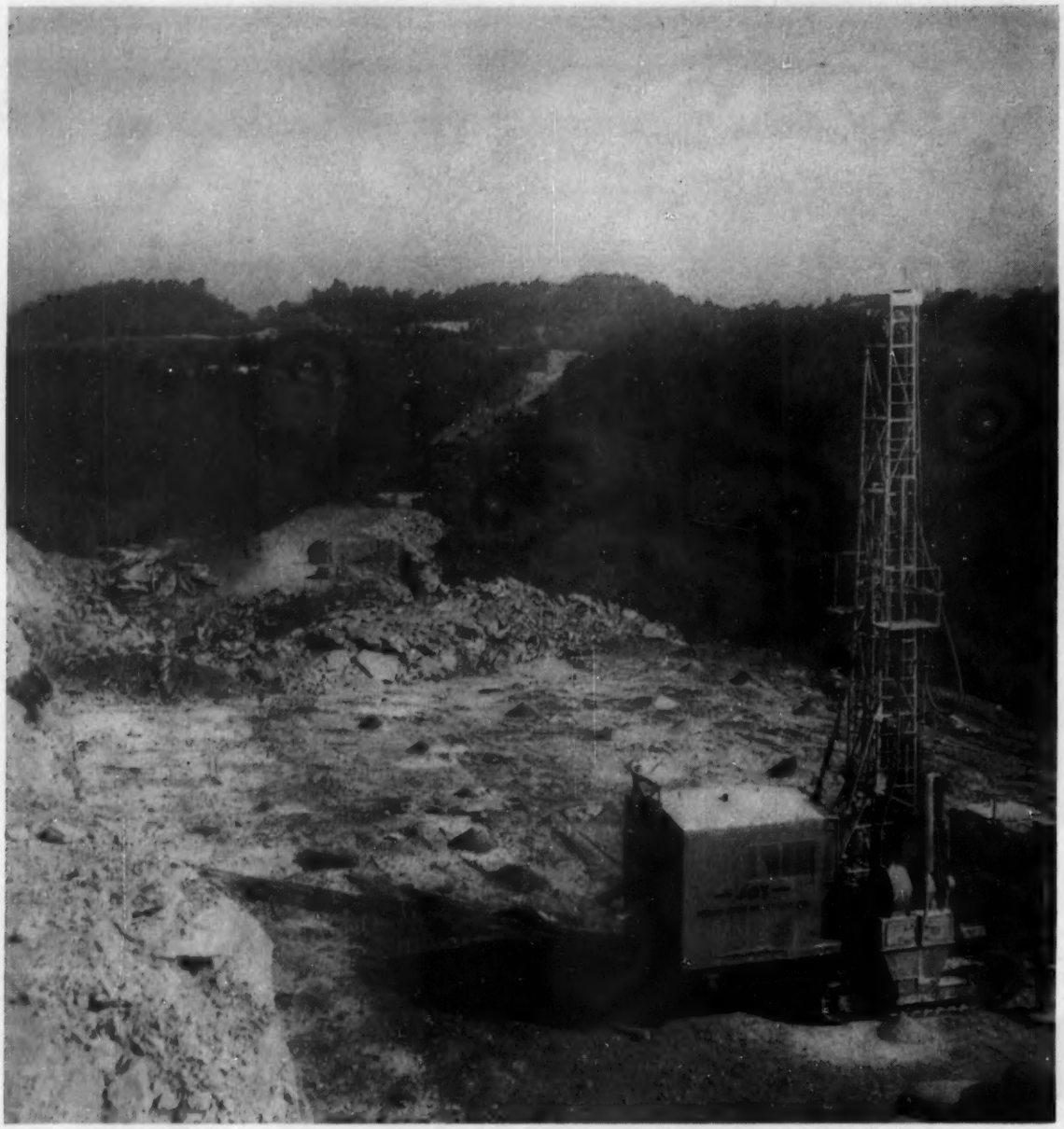
THERE is no other industrial engine on the market today comparable to this new Power Products engine. It is lighter in weight—more compact in design — requires less effort to start — is simpler to service than any other industrial engine. The design of this engine is the result of adapting to the industrial field many of the principles incorporated in the nationally known Power Products lawn mower and chain saw engines.

These famous engines were used on over 50% of all small rotary lawn mowers in 1953 and by every major chain saw manufacturer who purchased engines. The features these engines offered — lightweight and easy starting for lawn mowers — sustained performance at high speeds and heavy loads for chain saws— are combined in the new industrial engine.

If you make or use any industrial product that requires power in the range of 2 to 4 horsepower, it will pay you to investigate this engine. It can add important advantages to your product. Write today for complete specifications.

POWER PRODUCTS CORPORATION

GRAFTON, WISCONSIN



BLASTING TECHNIQUES on the West Virginia Turnpike have to be of the best to hold rock removal costs in line. Central Pa. Quarry, Stripping and Construction Co., Hazleton, Pa., uses big Joy Champion to drill blast holes ahead of shovel in rear.

Improved Methods Help Explosives Do a Better Job

This article was developed with the helpful cooperation of explosives engineers of the Atlas Powder Company. Rockmaster cap data are used to illustrate what can be accomplished with well-planned placing of properly delayed charges.—Ed.

EXPLOSIVES ARE A USEFUL TOOL in construction, as important as a shovel, bulldozer, rock drill or truck. Contractors, large and small, can save money, speed completion of jobs and improve public relations by a closer study of new explosives, delay caps, blasting machines and improved technique in using them. Better fragmentation and control of throw obtained by the new techniques will permit the use of both large and small equipment at higher rates of efficiency.

Bottom Detonation

Until recently, in quarrying for aggregate and other large-diameter hole work, no special attention was given to the point at which the charge in the hole should be detonated. Explosives were detonated at

CAREFUL PREPARATION of dynamite, caps and wire insure the kind of results in properly shattered and placed rock that make use of explosives more economical on big jobs.

IN TUNNELS, milli-second delay blasting and modern explosives produce superior breakage with lower powder consumption. Drilling pattern is important inside a tunnel as small as this one.

UNHARMED HOME within 64 ft. of blast on West Virginia Turnpike section worked by Latrobe Road Construction Co., Latrobe, Pa. Contractor used American Powder Co. products, applying milli-second delay caps to control breakage and shock wave.

the top of the hole, as a rule, because it was thought that the explosion was instantaneous and point of detonation did not matter.

Recent experiments and wide-spread practice show that better results are obtained when explosives are detonated from the bottom of the hole—usually the point of maximum confinement. With proper stemming, bottom detonation confines the explosive gases and makes them expend their energy in breaking rock instead of "geysering" and throwing rock excessively. The "toe" can be eliminated by bottom detonation.

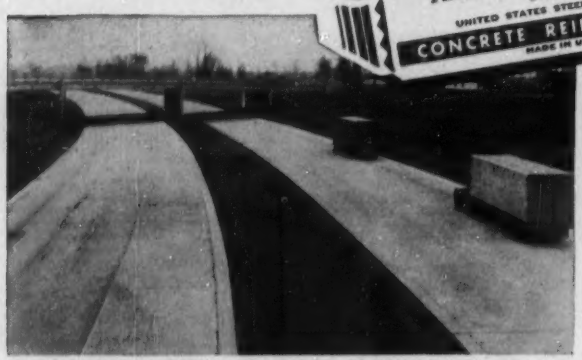
Milli-Second Delay

One of the most important developments in explosive science is the use of milli-second delay electric blasting caps. In the past all holes in one series were detonated at the same instant. A large quantity of explosive placed in 100 or more holes would be set off at the same time. The shockwave, vibration and noise were intense, fragmentation was irregular, damage to the back wall was severe and there was much flying rock.

With milli-second delay electric blasting caps, a wide variety of ingeniously planned delay patterns can be set up to stagger the explosion of the various holes. The delay element is built into each cap. The electrical impulse to each cap is initiated at the same time, but the caps themselves fire in milli-seconds after the initiation of the explosion from zero milli-seconds to

(Continued on page 98)

THE PENNSYLVANIA TURNPIKE was reinforced with American Welded Wire Fabric. American Welded Wire Fabric reinforcement prevents heaving, spalling, and pumping, assures peak road performance.



ILLINOIS STATE HIGHWAY ENGINEERS specified Welded Wire Fabric and Illinois Highway Contractors used American Welded Wire Fabric for the Edens Expressway, an important part of the highway network serving Chicago.

CITY STREETS, too, last longer and resist cracking better when reinforced with American Welded Wire Fabric.

Famous roads everywhere are reinforced with American Welded Wire Fabric

THE Pennsylvania Turnpike, The Edens Expressway in the Chicago area, the New York Thru Way, the Ohio Turnpike, and many other modern concrete roads are reinforced with American Welded Wire Fabric. This high quality reinforcement provides strength and shear resistance that not only meets, but *exceeds* standards set up by the new ASTM Specification A185-53T.

The manufacture of American Fabric is rigidly controlled to assure compliance with ASTM Specification. We take great care in making the steel, drawing the wire, and fabricating and testing the finished product. Quality inspections at every step of the way assure uniform wire size and spacing, sound welds, and great strength. All this adds up to greater assurance that your concrete will be as strong as it was designed.

Ask specifically for American Welded Wire Fabric. It comes in a style and size for every job, and assures good performance.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

EVERY TYPE OF REINFORCED CONCRETE CONSTRUCTION NEEDS

USS AMERICAN WELDED WIRE FABRIC

UNITED STATES STEEL

YOU'LL SAVE MONEY!

with the P&H Model 105

YOUR P&H DEALER WILL SHOW YOU HOW

FULL 10-TON CRANE CAPACITY

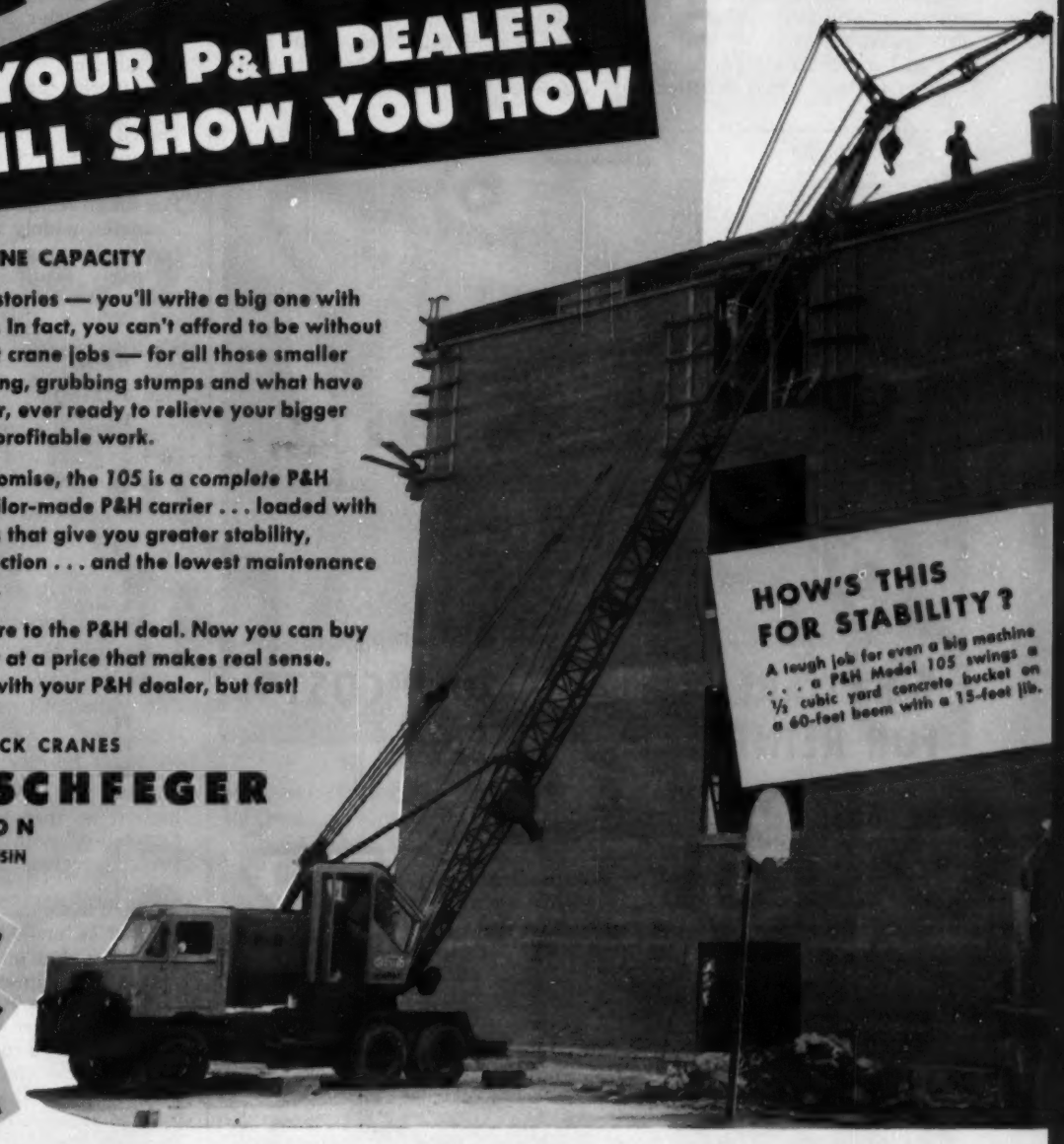
Talk about success stories — you'll write a big one with the P&H Model *105*. In fact, you can't afford to be without it. Use it on high-lift crane jobs — for all those smaller odd jobs . . . trenching, grubbing stumps and what have you. It's a cost cutter, ever ready to relieve your bigger machines for more profitable work.

No half-way compromise, the *105* is a *complete* P&H Truck Crane on a tailor-made P&H carrier . . . loaded with modern refinements that give you greater stability, bigger, faster production . . . and the lowest maintenance cost in the business.

But there's even more to the P&H deal. Now you can buy this terrific producer at a price that makes real sense. Don't delay, check with your P&H dealer, but fast!

P&H TRUCK CRANES

HARNISCHFEGER
CORPORATION
MILWAUKEE 46, WISCONSIN


HOW'S THIS FOR STABILITY?
A tough job for even a big machine . . . a P&H Model 105 swings a ½ cubic yard concrete bucket on a 60-foot boom with a 15-foot jib.

See your P&H dealer NOW!

Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H Dealer is tops in the business. Get to know him.

the P&H *Line*

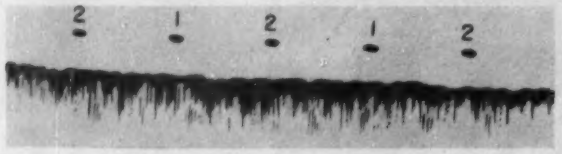


FIG. 1 . . . FUNDAMENTAL TYPE of pattern in a single row of holes using alternate method. No. 1 holes detonate 17 sec after 2's.

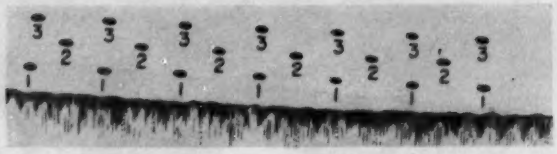


FIG. 2 . . . SIMPLEST METHOD of alternating with more than one row of holes. Throw toward open face (forward) would be excellent.

550 milli-seconds, according to the accompanying table. There are 17 caps in the series.

Fig. 1 indicates one fundamental type of pattern which is called the alternate method. In a single row of holes, the even-numbered holes are primed with Rockmaster No. 1 which causes these holes to detonate eight milli-seconds after initiation. The odd holes are detonated by Rockmaster No. 2 in 25 milliseconds after initiation.

Therefore, the rock is blasted in two increments. While the rock broken by the explosive in holes loaded with Rockmaster No. 1 is loosened, it receives an impact from the explosion in the No. 2 holes. For tough resilient rocks with large diameter, widely spaced holes, better results may be obtained by alternately loading the holes with Rockmaster No. 1 and No. 3, or even higher, so that the rock may be "stretched" with the first blast before it receives the impact of the second.

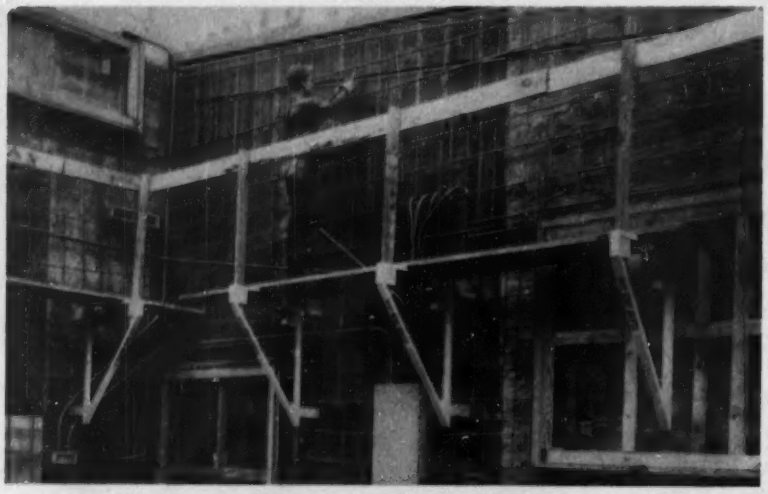
Rockmaster Detonator Number	Avg. Delay Time After "Zero" (milli-seconds)
0 (Zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

When more than one row of holes is used in one blast, the simplest method is shown in *Fig. 2*. Here the row of holes closest to the open face is loaded with Rockmaster No. 1, the second row with Rockmaster No. 2, the third row with Rockmaster No. 3 and so on. With this pattern, the body of rock being blasted would receive one impact after another. The "throw" would be excellent. Endless variations of the pattern shown in *Fig. 2* with that shown in *Fig. 1* are possible. With the patterns in *Fig. 3*, for instance, the throw would be somewhat less than in *Fig. 2*, but breakage would tend to be better.

In cases where reduction of vibration is the primary aim, the pro-

(Continued on page 102)

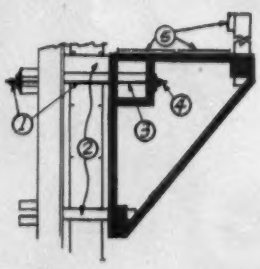
(Advertisement)



WHAT ARE *YOUR* SCAFFOLD COSTS FOR REINFORCING STEEL?

Erecting scaffolding — single pole or sectional — is expensive, wastes time and material, and continuous vertical members are in the way of steel handling. These problems are eliminated with CLAMP-JACK scaffold brackets, which require no ground support members regardless of working height.

This practical system is quickly anchored to forms or walls with standard form hardware (including coil type form bolts or snapties), in the following simple manner:



1. Insert form bolts in normal manner.
2. Slip 2 x 4 standoffs into pockets, and
3. Slide CLAMP-JACK over bolt against inside face of first form wall.
4. Spin on second cathead and tighten.
5. Place handrail post and scaffold planks.

Two men can normally erect 100 feet of CLAMP-JACK scaffolding, complete with handrails and planks in 1 hour. Each bracket provides 50 to 80 sq. ft. of scaffolded area at ¼ to ⅓ the cost of standing scaffold. When reinforcing steel is in place, CLAMP-JACKS are removed in a matter of minutes, leaving the way clear for second form wall. They are also used for erecting and stripping forms, additional lifts, breaking off snapties, patching and finishing walls, and many other jobs. Accepted by Safety Men and State Industrial Accident Commissions. Write for illustrated application bulletin.

NO-RISK RENTAL PLAN! Prove to yourself the economies, versatility and safety of CLAMP-JACKS. Rental is only $1 each per month, F.O.B., Sacramento. You can apply first 3 months rent at any time against purchase price of $9.95, F.O.B., Sacramento. Dealer inquiries invited. Write Continental Scaffolding Co., Box 2551, Sacramento 12, California.

High lift, Big load capacity, Wheeler speed charge hoppers at lower cost

Bin-batching costs drop fast when mixing plants load hoppers with high-lift, long reach, fast-moving MM Wheeler-Loader units.

Loader attachments, built specifically for 30 hp. RTI and 57 hp. UTIL Minneapolis-Moline Wheelers, reach *up* to load the highest hoppers, *out* to fill trucks, cars, conveyors.

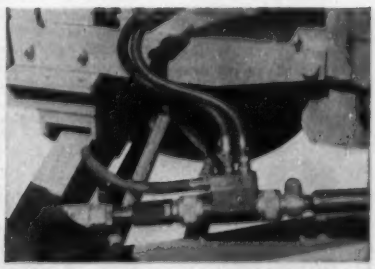
With exclusive shuttle speeds and instant reversing, the UTIL combines high rate of travel and hydraulic pump efficiency to make each load-and-dump trip in shortest possible time.

Reserve Wheeler power and greater torque at moderate rpm keeps Wheelers operating in heaviest going. For short, fast maneuvering in congested areas, Minneapolis-Moline offers heavy-duty power steering at lower cost. For any loading job, call in your Minneapolis-Moline dealer-distributor. Let him demonstrate how you can save money by replacing expensive, less maneuverable equipment with lower-cost time-saving Minneapolis-Moline Wheeler units.

MINNEAPOLIS-MOLINE
Minneapolis 1, Minnesota

Owner of this St. Paul, Minn., mixing plant replaced two loader outfits with this MM Wheeler-Loader unit, loads bins for less.

Wheeler maneuverability plus good bucket control speeds up surface mixing operations. Shuttle gearing spots loads in half the time.



UTIL Wheelers available with hydraulic POWER-flow steering for maximum operating ease. Built-in safety features insure constant control.

Need more tons of asphaltic concrete for Superhighways, Airports, Turnpikes Expressways, Big-city Markets?

Cedarapids

Built by IOWA

NEW 6000-LB.

MODEL G-60

BITUMINOUS MIXING PLANT

3 TONS PER BATCH MEETS BIGGEST DEMANDS . . . CUTS PRODUCTION COSTS!

BIG FEATURES FOR THE BIG JOBS

Fully automatic controls (optional). Weighs, batches, mixes, discharges and starts new cycle without operator, gives up to 10% increase in capacity. ● Progression indicator lights insure accurate batching. ● 60-cu. ft. mixer capacity BELOW center line of shafts gives 6000 to 6500-lbs. per batch! ● Welded steel mixer body fully jacketed. Liners of ½" manganese steel built in sections for easy replacement. Two U-shaped manganese castings around discharge gate protect mixer body from wear. ● 7" diameter heavy-duty mixer shafts. Spherical, self-aligning bearings rest on heavy H-beams which transmit load to main structure, eliminate strain on mixer ends. Bearings placed away from mixer body for cool running and maximum life. Generously sized anti-friction bearings used throughout plant. ● Efficient "runaround" paddle arrangement. New rigid bar-type double paddle arms, with wear-resisting floating removable sleeves, extend completely through mixer shafts. ● Smooth-running 4' x 14' horizontal vibrating screen produces 4 sizes, plus oversize, has plenty of reserve capacity. Specially adapted for asphalt plants with power unit placed in the open on end of screen, out of heat and dust. ● Rigid heavy-duty columns and structure throughout for minimum vibration. All columns and bracings interchangeable. ● All wiring meets National Standards Association latest specifications. ● Highly portable. Each component unit has its own running gear and erection device. Plant can be erected from columns to hot elevator in less than two days. ● Equipped with 4-compartment cold aggregate storage bin and positive, proportioning type of feeder. ● Asphalt bucket of ¼" plate entirely jacketed. Asphalt spreader pan runs entire width of mixer. ● Pneumatic controls eliminate operator fatigue, speed cycle time in manual operation. ● All hot elevator bearings mounted outside of enclosure for maximum life and easy access for lubrication. ● Exceptional freedom from dust with "scavenger" system and plant design for "breathing" within itself. ● Capacity conservatively rated 150 tons per hour, depending on mixing cycle time.

TODAY's big bituminous paving jobs demand increasingly higher tonnage output of asphaltic concrete. That's why Cedarapids designed the 6000-lb. Model G-60 . . . so you can meet those increased tonnage demands fast, and make a higher profit on each ton produced! Every feature in this new Cedarapids plant is designed for big production . . . 180 tons per hour and more, with completely automatic controls. Every unit in the G-60 is quality-built for the balanced, efficient, long-life performance that keeps maintenance costs low.

Your Cedarapids distributor will gladly tell you the full story of the Model G-60 high-production, high-profit performance. See him today.

IOWA MANUFACTURING COMPANY ● Cedar Rapids, Iowa, U.S.A.

Commander
Crushing and Screening Plant

Vibratory Soil Compactor

Motorized Head Pulley

Master
Bituminous Mixing Plant

(Advertisement)

GENERAL MOTORS

leads the way again with the first full line of

AUTOMATIC DRIVE TRUCKS

THIS announcement marks the achievement of a goal towards which General Motors has been working for a quarter-century.

That is the elimination of manual gearshifting in GM-built motor vehicles—*trucks as well as cars*—a task first undertaken by our research engineers in 1929.

It was no easy assignment. It took more than ten years of hard work, the testing and discarding of hundreds of different mechanisms, before the problem was superbly solved in passenger cars by our Hydra-Matic, Dynaflow and Powerglide automatic transmissions.

In trucks the need for a self-shifting drive is infinitely greater—and so is the engineering problem because of the far heavier loads carried and the larger number of forward-speed gears required to move them.

It was not simply a matter of adapting a passenger car drive. A completely different automatic unit had to be designed and that took still more time.

But by 1950, our GMC Truck & Coach Division had developed and thoroughly road-tested a Dual Range Hydra-Matic-type drive for medium-weight trucks. Then came Korea and our entire production of Truck Hydra-Matic Transmissions was required for army vehicles where its superiority was proved in front-line service.

Within the past eighteen months both four-speed and eight-speed versions of this battle-proved transmission have been successfully introduced to the public in light-duty and middleweight GMC trucks. But there still remained the problem of heavy-duty trucks, some of which require as many as 15 forward speeds.

Now our engineers—drawing upon this backlog of twenty-five years' experience—have developed a Twin Hydra-Matic Multiple-Speed self-shifting drive for trucks rated above forty-five thousand pounds gross combination weight.

Thus has GM marshalled its inventive skills to bring the many advantages of Hydra-Matic Hauling to every class of truck operator. These benefits include:

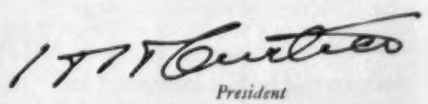
Lower fuel cost—because Truck Hydra-Matic automatically keeps the engine in proper gear for every operating condition, eliminating wasteful engine "gunning."

Less maintenance expense—because Truck Hydra-Matic prevents "shock-loading" strains on engine, drive line and rear axle—plus the fact that there is no clutch to repair or replace.

Greater safety—because Truck Hydra-Matic does the shifting, easing the driver's work and permitting him to concentrate on the road ahead.

I think these are good reasons why every user of trucks should investigate the GMC line of Hydra-Matic Trucks—whether you use a small pickup or a fleet of heavy highway haulers.

You are cordially invited to call upon your local GMC dealer to learn more about them.

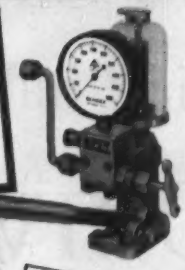


President

GENERAL MOTORS CORPORATION

Diesel SHOP EQUIPMENT

NOZZLE TESTER for Bosch Caterpillar International Harvester Injectors



INJECTOR TESTER for GM 71 Injectors Similar Tester for GM 110 Injectors Available

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COMPRESSION TESTERS for All Makes and Types of Diesels

Other Diesel Shop Equipment:
Nozzle and Injector Cleaning Kits • Lapping Blocks and Sets • GM 71 Engine Service Tools • GMC Coach and Truck Tools • Fuel Pump Calibrating Stands

WRITE TODAY for our complete Shop Equipment Manual showing these and more than 300 other testers and tools engineered specifically for Diesel maintenance and repair.

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7301 Penn Avenue • Pittsburgh 8, Pa.

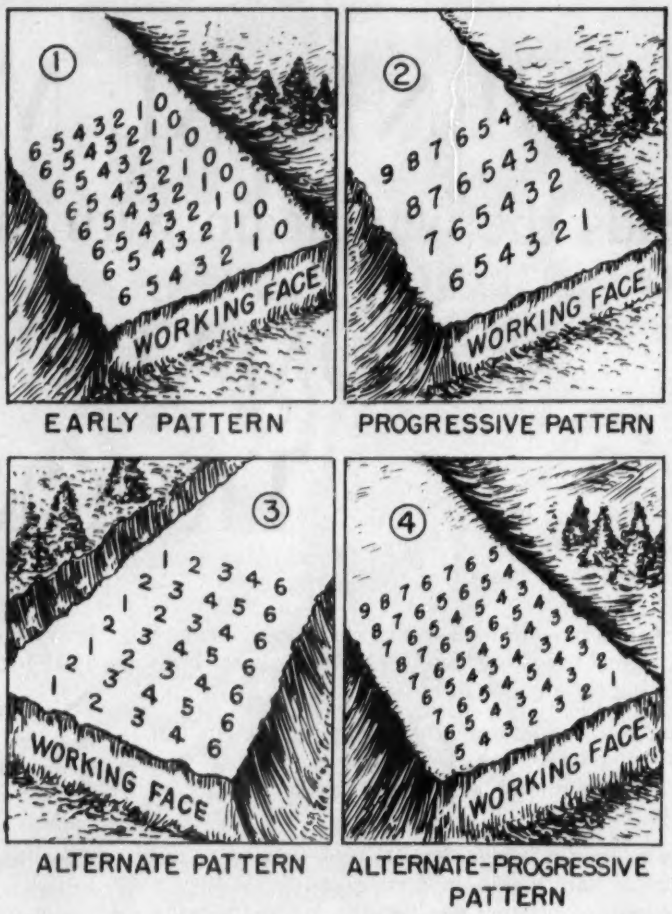


FIG. 3 . . . VARIOUS PATTERNS. In upper left, line of holes with "O" delay would detonate first to provide a path for rock loosened by explosives in No. 1 holes, and so on.. Direction of throw would be toward No. O holes to form a windrow. Upper right: Detonation would be in diagonal pattern and throw pronounced toward hole No. 1. Lower left: With alternate pattern direction of throw would not be pronounced, but breakage better. Lower right: Combination pattern usually gives more definite direction of throw with good breakage. Throw would be diagonally toward No. 1 hole.

gressive pattern is recommended. As in *Fig. 4*, page 105, a single row is loaded progressively with Rockmasters 1 through 16. Breakage is better than if all holes are fired at once, and vibration is reduced greatly because the shock and noise wave never builds up to a magnitude greater than that from one hole.

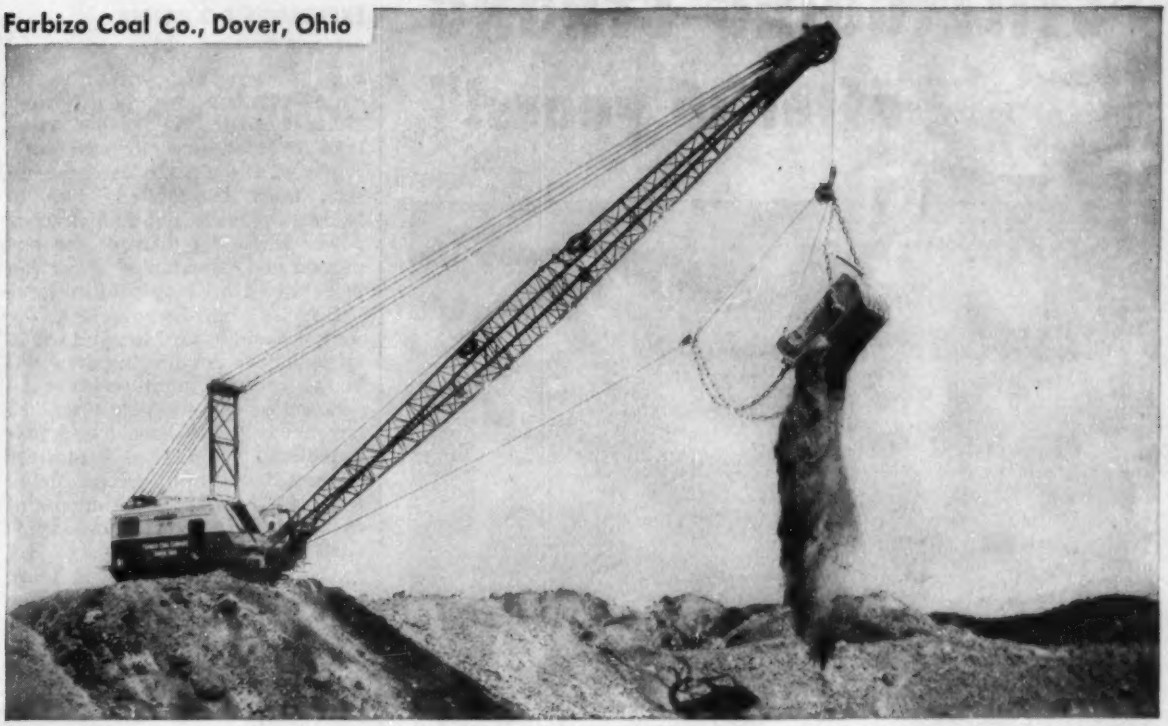
As a general rule, the later delay caps are used in the back row of holes and along the sides, where, for instance, a cut is being made through a hill. The short delay caps are used near the working face. By providing a path of least resistance, the short delay caps provide a place to go for the rock broken by the later delay caps.

Far better breakage and fragmentation are obtained with millisecond delay electric blasting caps. Secondary blasting is virtually eliminated. The size of blasted rocks is reduced, smaller shovels and other equipment can be used safely to handle the muck. Also, being of finer size, the muck can be used more readily as fill.

Because the direction of throw

(Continued on page 104)

Farbizo Coal Co., Dover, Ohio



2 Years Old!...16,280 Hours!...No Repairs! ...Oil Consumption Unchanged! With Cities Service DC-330 Oil

ONE OF FARBIZO'S GRADALLS has done an outstanding job on a 38 core slag pit. Cities Service DC-300 oil keeps Farbizo's hard-working Gradall shovel in top shape.

IN THEIR TD 24 BULLDOZER TOO, Farbizo relies on heavy duty, high detergent Cities Service DC-300 oil. Heat-resistant, long-lasting and free-flowing DC-300 does the finest job possible.

Twin G. M. C. Diesels in Marion Shovel Give Outstanding Performance!

Here's the story from the Farbizo Coal Co.:

"Following are the pertinent facts with reference to the Marion 111 M Shovel using DC-330 Oil since January, 1951:

"Developed ample power with TWIN G.M.C. Diesels operating at 1550 R.P.M. Operated 16,280 hours with no motor breakage or repairs. Mined 203,000 tons of #5 coal from 36" seam with an average over burden of 35 feet hard pan shale with streaks of iron ore bands.

"Oil consumption 1 pint per week, oil and filters changed weekly. Consumption is same as when shovel was new. Motors were recently inspected but no repairs or replacements needed. Unusual performance praised by G.M.C. and Marion Shovel representatives.

"Similar results using DC-300 Oil in two Gradall shovels and International TD 24 Bulldozer."

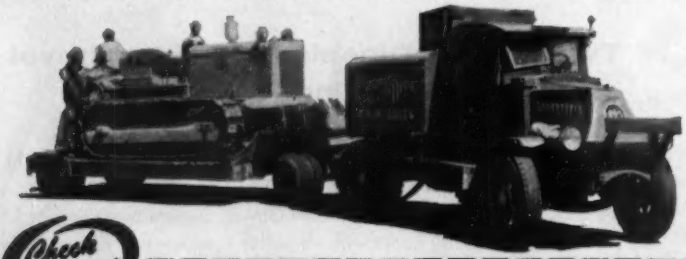
Let Cities Service lubricants protect the important investment you have in your machinery. Call your nearest Cities Service representative or write Cities Service Oil Co., Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

"STILL GOING STRONG -after 16 years!"

These two early model LaCrosse low bed trailers were purchased by *RINGLING BROS. and BARNUM & BAILEY CIRCUS* in 1938. On the road 32 weeks out of every year, both trailers have performed yeoman service in transporting 13-ton tractors between trains and circus lots . . . and in moving other heavy equipment at various show sites. Between seasons, the trailers are used to haul all sorts of materials at the circus winter headquarters, in Sarasota, Fla. According to D. A. Blanchfield, Superintendent of Transportation, **"Maintenance costs on these two LaCrosse trailers have been NEGLIGIBLE through 16 years of hard use, which means they had to be built practically FOOLPROOF."** So why pay more! Insist on dependable LaCrosse low beds — for extra years of trouble-free service—*at 5% to 25% saving in first cost!*



LC-31

Check Today!

LaCROSSE TRAILER CORPORATION, LaCrosse, Wis.

☐ Rush complete information on LaCrosse trailers:
☐ Specifications ☐ Prices ☐ Delivery

☐ Send name of nearest LaCrosse Distributor.

☐ We may buy a ..... ton trailer about ..... (date)

Name ..... Title .....

Employed by .....

Address .....

City ..... State .....

LaCROSSE

America's Favorite **LOW-BED TRAILER**

EXPLOSIVES DO BETTER . . .

Continued from page 102

can be controlled within rather close limits, muck can be deposited either close to the face or away from it. It can be windrowed in the center of the cut. In cases where rock must be blasted close to houses, railroads, public highways, power lines, the force of the explosion and direction of throw can be pointed away from these objects.

Because vibration is less, the nuisance and hazard to uninformed citizens near the blasting area will be reduced, and the relations of the contractor with the public will be improved. It has been found that a reduced quantity of explosives detonated by milli-second delay caps will break the same amount of rock as a larger quantity of explosives set off simultaneously. Because the vibration is less, more powder can safely be shot at one time than with the simultaneous system.

Alternate Velocity Blasting

The most recent innovation in explosive practice is alternate velocity blasting. Using bottom detonation and milli-second delay blasting caps, it has been found that loading a row of holes alternately with high velocity explosive and low or medium velocity explosive of the same strength, far better fragmentation will be obtained—especially in hard, brittle rock—by exploding the low or medium velocity charges first. Then, while the rock is under stress from the low velocity explosives, it receives a sharp impact from the high velocity material. This loading method has proved successful in many quarries and is being tested in construction work with wagon drill holes.

Public Relations

Blasting for pipelines, sewers and highways in the past has given construction a poor reputation that it does not warrant today. Not all of the poor public relations attributable to blasting is the fault of the materials and techniques. Many supervisors are to blame for rough and ready methods. This is especially true of pipeline and sewer work where throw of the rock out of the hole is all-important. Some operators have overdone this and have scattered rocks over wide areas and close to facilities used by the general public.

With the new explosives and methods of using them, it is not

(Text continues on page 108)

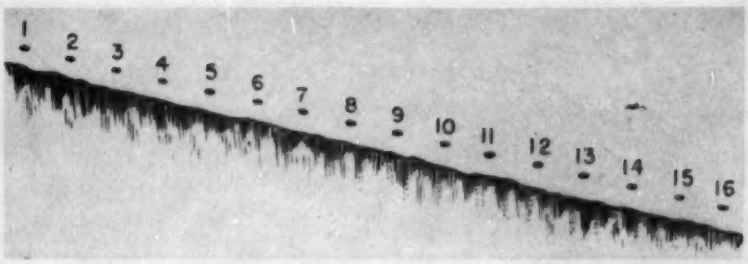


FIG. 4... FOR REDUCTION OF VIBRATION, progressive pattern is recommended. Breakage is better, and shock and noise wave do not build up greater than that coming from one hole.

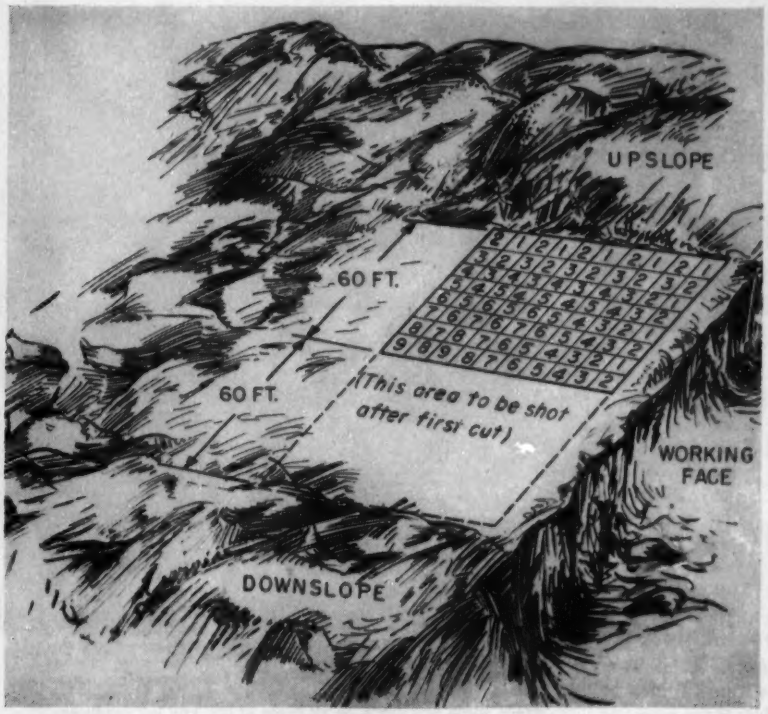


FIG. 5... COMPLEX TIME PATTERN for milli-second delay caps employed to take out a rock cut for New York Thruway near Suffern houses by L. D. De Felice & Son, Inc., North Haven, Conn.

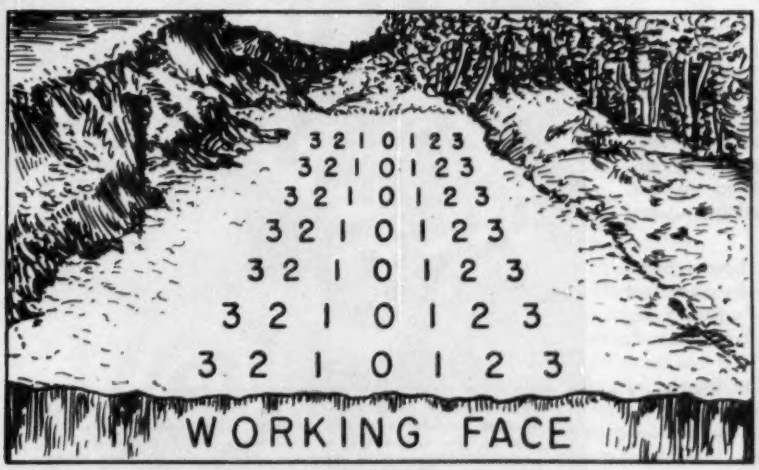


FIG. 6... ROCK WILL CENTER on the "O" line, moving from both sides toward the middle when this pattern is used—recommended when blasting near buildings, railroads or highways.

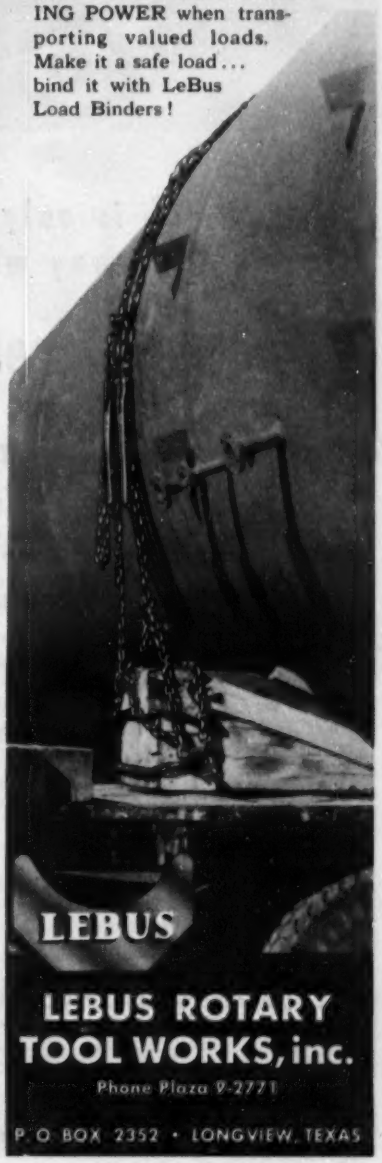
4

LEBUS BINDERS

HOLDING

158,000 lbs.

Pictured is a portion of a 158,000 pound vessel being transported by the Musselwhite Trucking and Rig Building Company. Shown here are two of the four LEBUS LOAD BINDERS used to hold this load... further proof that truckers depend on LeBus Load Binders for STRENGTH, SAFETY and REAL HOLDING POWER when transporting valued loads. Make it a safe load... bind it with LeBus Load Binders!



LEBUS ROTARY TOOL WORKS, inc.

Phone Plaza 9-2771

P. O. BOX 2352 • LONGVIEW, TEXAS

Next job is only minutes away with

mobile trencher

Parsons rubber-tired Trenchmobile® runs anywhere at a moment's notice. A job 6 miles away can be started in less than 30 minutes from "now". Trenchmobile drives there cross-town, through traffic at 12.6 m.p.h. . . . digs the trench at speeds up to 14½ feet per minute . . . drives on to next job without delay.

This mobility on rubber is the answer to all those widely-scattered, small yardage trenching jobs where you formerly had to bring in cumbersome, oversize equipment, or use slow, costly hand labor. Trenchmobile is big enough, too, for a lot of main-line excavations. You get trench widths from 8 to 16 inches . . . depths to 5 feet, for water and gas mains, service connections, pipe reclamation, foundation footings, underground cables, lighting systems.

Let Parsons distributor show you how rubber-tired Trenchmobile can put your jobs on a fast "work-and-run" basis. Also check Parsons 5 big sizes of ladder and wheel-type Trenchliners®.

HOLDS ACCURATE GRADE . . . Positive down-crowd on the digging boom starts cut fast, maintains accurate grade. Buckets are high-carbon cast steel. Self-sharpening, easy-in-easy-out "Tap-In" teeth assure top digging efficiency at every width and depth, in all types of soil and job conditions.

BACKFILLS ITS OWN TRENCH . . . Backfill blade (optional) doubles usefulness of the Parsons Trenchmobile . . . lets you do the entire job of trenching and backfilling with one-man, one-machine economy. The husky six foot blade is readily adjustable from straight bulldozing to angled position . . . is raised and lowered by hydraulic control.

• • • • • *Send to:* **PARSONS CO., Newton, Iowa** • • • • •

for literature on 43.6 h.p., rubber-tired Trenchmobile

NAME_____

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STREET_____

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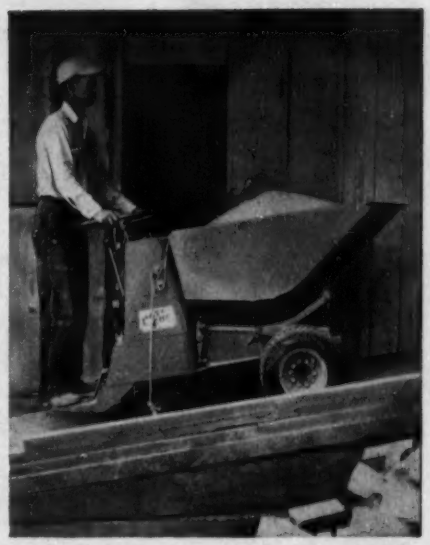
DODGES SIDE OBSTRUCTIONS . . . Shiftable, reversible belt conveyor places spoil bank on either side of trench . . . lets Parsons Trenchmobile work in close to buildings, poles, without swerving from grade line.

UNDERCUTS SIDEWALKS . . . With reverse traction and sloping ladder boom, Trenchmobile undercuts walks, curbs, gutters, old mains . . . makes vertical cut-ins, flush against foundation walls. Saves hand work. Hinged crumber swings up, out of the way.

Kwik-Mix Moto-Bug® carries 1500-lb. load

Moto-Bug power wheelbarrow hauls 10 cu. ft. (or 1500 lbs.) of any bulk materials. Has instant gravity-dump, with snub-line control. Climbs 20% ramps or grades. There's full power forward and reverse . . . and safe, automatic brake control. Hopper is interchangeable with 1500-lb. platform, or ½-ton (5-ft.) fork lift. Send for Moto-Bug bulletin. Also check Kwik-Mix line of concrete mixers, bituminous and plaster-mortar mixers.

KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)



Johnson fast-filing "Hi-Speed" Batchers

handle 2, 3 or 4 materials. Extra-wide 15"x36" fill valves and wide bin top openings reduce charging time . . . steep side slopes give fast, clean discharge. Standard batcher handles 34-E paver batch. For charging truck mixers, 4 material "Hi-Speed" Batcher can be furnished with 2, 3 or 4-yd. weigh hoppers having double clam discharge gate and collector ring. Also check the complete Johnson line of mix plants, bins, buckets and silos.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)

More work-time with Koehring ½-yd. 205

There's no time-out for continuous manual clutch adjustments . . . no "compromise" settings with this Koehring heavy duty ½-yard. All main clutches are self-adjusting . . . heat-compensator springs make tension changes automatically. This maintains big yardage performance with shovel, hoe and dragline, is equally important on intermittent usage of crane and clamshell work. 3 larger sizes up to 2½ yds., cranes to 79½ tons.

KOEHRING Company
Milwaukee 16, Wis.

262

(Advertisement)

3 Walers on 16′ Wall

Henry Carlson Const. Co., Sioux Falls, S. D., used only 3 walers with Symons Forms on 16′ high 12″ thick wall for City Water Treatment Plant. 10,000 square feet of Symons Panels were reused 12 times on the job, resulting in savings of labor, material and fast forming.

To pour these high walls certain upper panels were raised 1 foot to permit pouring through side openings for the first 8 feet of concrete.

Send the plans for your next job and get complete layout and cost sheets—no obligation. Catalog F-9 available on request. Symons Clamp & Mfg. Co., 4255-F-4 Diversey Ave., Chicago 39, Illinois.

FUNK
GEAR REDUCTION POWER TAKE-OFFS
FOR INDUSTRY AND AGRICULTURE

with the exclusive Straddle Mounted Pinion . . .

This exclusive Funk development assures complete gear tooth contact at all times by providing a pinion with a taper roller bearing support at each end driven by an input shaft with a lubricated floating spline, eliminating misalignment from improper installation or load deflection . . . some of the many reasons why you can expect longer, trouble-free service from FUNK Gear Reductions. Fit all SAE flywheel housings. Special ratios or special adaptions of standard units supplied on small orders. For keeping old equipment on the job economically, write for catalog and prices of Funk Power Take-Offs and Gear Reductions.

FUNK PRODUCTS INCLUDE:

Right-Angle Take-Offs.

Front End Take-Offs.

Jack Shaft Extensions.

Ford Tractor Conversion Kit adapts 6 Cyl. Ford engine, double power. (See picture below.)

Here is a new NAA Golden Jubilee Ford Tractor converted with Funk NC Kit, other kits for any Ford Tractor.

FUNK AIRCRAFT CO.
3303 Airport Drive, Coffeyville, Kan.

EXPLOSIVES DO BETTER . . .

Continued from page 104

necessary to incur public displeasure or become involved in lawsuits. Where cuts are being made close to houses, roads, railroads or powerlines, the proper arrangement of milli-second delay caps can direct the throw away from such facilities and can reduce vibration to a minimum.

In the Suffern section of the New York State Thruway, L. G. De Felice & Son, Inc., of North Haven, Conn., sets off as high as 1,500 lb of explosive loaded in wagon drill holes 25 ft away from dwellings along a main street of the city. Not only has flying rock been eliminated by the use of milli-second delay caps but the average citizen is not even aware that a blast has been detonated. When this job first started, the people of Suffern were apprehensive about blasting operations because of a bad experience a number of years ago.

Many Tasks Performed by Blasting

Where rock can be used as a fill, the throw can be directed so that the broken rock is in place at the end of the blast with very little additional placement required by bulldozers.

It can be used to settle fill over soft ground. Pipes are laid and covered by the early fill. Explosive is loaded in the pipes and the pipes extracted. When the charge is exploded, it drives the mud out from under the fill so that the new material will settle.

In cases where aggregate can be produced on or near the job, the cost can be reduced by the better fragmentation achieved with milli-second delay blasting.

In tunnel work, where breakage is especially important because of the impracticability of using large mucking equipment, milli-second delay blasting and modern explosives play an important part. This technique is only now getting the appreciation of tunnel driving crews. Properly used it produces superior breakage with a lower powder charge.

On the Suffern section of the New York State Thruway referred to above, an interesting sequence of making the cut was employed. Instead of making the full width of the cut of about 120 ft at one time, De Felice is making the cut in two sections. De Felice is blasting and excavating the 60-ft section away on the upslope line from the houses first. (See "Skillful Blasting,"

CM&E May, p. 82.) Then he goes back to the start and blasts the section closest to the houses, using milli-second delay caps to direct the throw of rock into the first cut. A rather complex time pattern with milli-second delay caps has been used (*Fig. 5, page 105*).

An important new aid in developing the most efficient blasting patterns and in evaluating over-all performance is the machine-gun camera. Developed during World War II for photographing damage wrought by aircraft bombs, this camera takes large photographs at intervals of 1/3 of a sec. It is relatively simple to use.

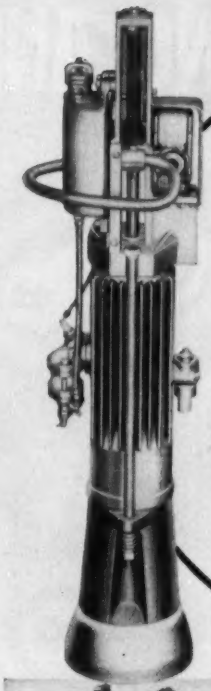
The end product is a sequence of large clear photographs which can be studied. For instance, a study of such a sequence of photographs will detect holes that did not detonate, misfires, the results of inadequate stemming, excessive flying rock. A comparison can be made between different kinds of explosives, different patterns, different time arrangements and so on.

Explosive Engineering Changes Rapidly

Although many engineers and contractors take explosives for granted, it is a fast moving industry today. In addition to the major advances such as the importance of bottom detonation, milli-second delay electric blasting caps and alternate velocity blasting, improved blasting machines are now available. There is a new portable blasting machine of the condenser discharge type which is generator-operated. A specially wound, dc generator is hand-cranked through a gear reduction permitting moderate cranking speeds. To prevent firing before the condenser is fully charged, an accurate relay is wired into the firing circuit. Although the actuating button can be depressed while the operator is building up the charges in the condensers, the firing circuit cannot be closed (and the explosive fired) until the condensers are delivering the full 450 v to the relay. It has a capacity to fire up to 50 caps in parallel and up to 1,200 when properly connected in parallel series.

There are specific explosives for practically every type of material. There are explosives recommended for dry use and those permissible for wet material. There are explosive charges made which consist of a high explosive booster as the core, surrounded by a low velocity explosive. It will pay to take advantage of latest developments.

For the LOW BID on any job, figure your costs with BARCO



BARCO *Gasoline* RAMMER

BETTER BUILDING CONSTRUCTION! This job called for high degree compaction. The Barco Rammer did it at the rate of 1 to 1½ square yards per minute with 12" to 20" lifts and handled from 160 to 240 cu. yds. per 8 hour day.

CUTS TRENCH COSTS! Using lifts up to 24", this Rammer finished backfill in 18" trench at a rate of 360 to 600 feet per hour for quick completion of job and no cost for additional backfill.

SOIL COMPACTION is here to stay! *Specified Compaction* is now accepted practice on all modern construction projects. The BARCO RAMMER gives you specified compaction on these jobs at very little extra cost. Time after time, it has been proven that no other type of equipment can match BARCO PERFORMANCE:

- Better work! Easy to meet specifications calling for 95% to 97.5% (modified Proctor) compaction.
- Ideal for work in restricted areas: inside buildings, close to walls, culverts, and abutments—in trenches, ditches.
- Faster compaction! 20 to 30 cu. yds. per hour—day in and day out.
- One man operation! Completely self contained; no auxiliaries needed.
- Low operating cost. Low initial cost.
- SAFE! Simple to operate. Operators like Barco Rammers.

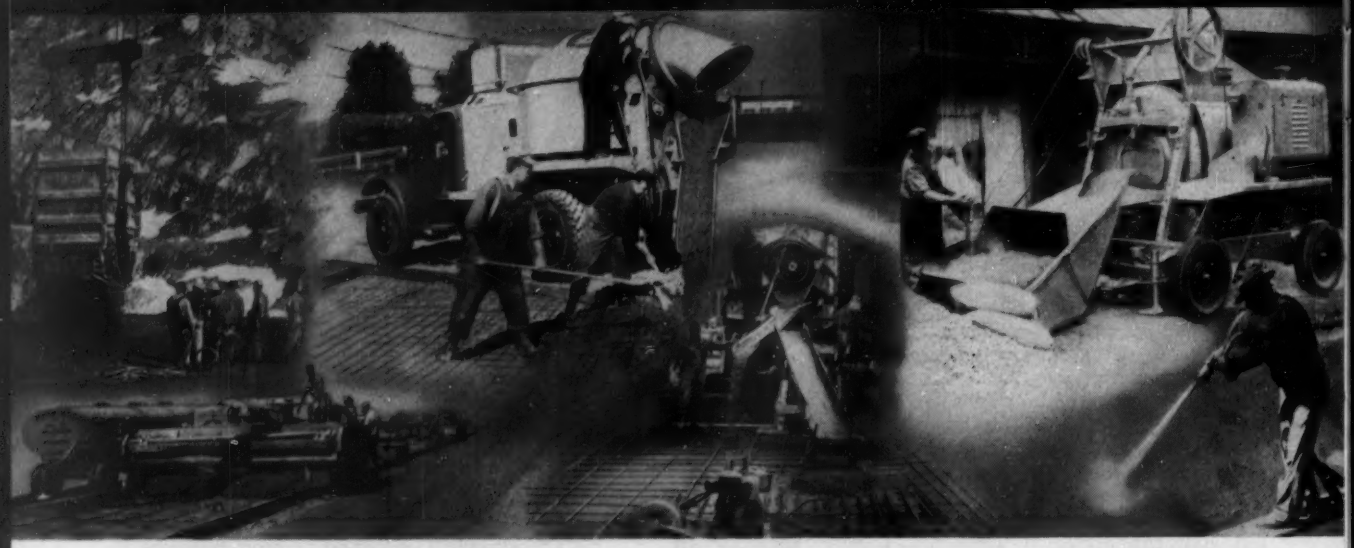
ASK FOR A DEMONSTRATION—See for yourself—ask for our nearest distributor to give you a demonstration. Catalog No. 621 on request.

BARCO *Manufacturing Co.*

512G Hough St., Barrington, Ill.
A Chicago Suburb

NOW! QUICK DELIVERY FROM FACTORY STOCK!

CONCRETE MIXING AND PLACING



7. Ready-Mixed Concrete Plants

By THEODORE B. APPEL, Jr., Chief Engineer, The C. S. Johnson Co., Subsidiary Koehring Co.

READY-MIXED CONCRETE PLANTS divide into two major classifications, transit-mix plants and central-mix plants. The transit-mix plant is the simpler of the two since it does not have any mixing facilities. It is designed to handle, store and batch concrete-making materials. These are mixed in a truck mixer while en route to the job.

The central-mix plant has all of the features of the transit-mix plant, plus permanent mixing facilities. The batcher discharges into the mixer. Mixed concrete is discharged into the haulage unit which may be a truck mixer, an agitator or a special truck dump body. In some central-mix plants mixers are used primarily to pre-shrink the materials rather than to mix them. Furthermore, central-mix plants are sometimes equipped with a dry batch chute to allow by-passing of the mixer. In this case materials go directly from batcher to transit-mix truck.

Shrink-Mixing

There is a considerable advantage in using a mixer to pre-shrink materials. The materials that go into a 3-yd batch of concrete will, prior to intermingling and mixing, occupy a space considerably in excess of 3 yd.

When the materials are intermixed or pre-shrunk in a mixer prior to charging into the transit-mix truck there will be less cu ft of material charged into the mixer, and charging can be accomplished in less time. Pre-shrinking will reduce the tendency for build-up of materials on the forward end of the mixer drum and reduce the tendency for "balling."

Central Mix Dry Batching

Central-mix plants equipped to allow direct transit-mix charging from the batcher require relatively long chutes because the batcher must be above the plant mixer. This long dry-batch chute is apt to be the source of considerable trouble. In the first place, rather severe dusting of the cement must be expected due to the 10- to 12-ft drop of the cement.

In the second place, intermingling of cement and moist sand produces a rapid build-up of cement —sand paste on the sides and cover of the dry batch chute. For this reason the use of these chutes is not recommended.

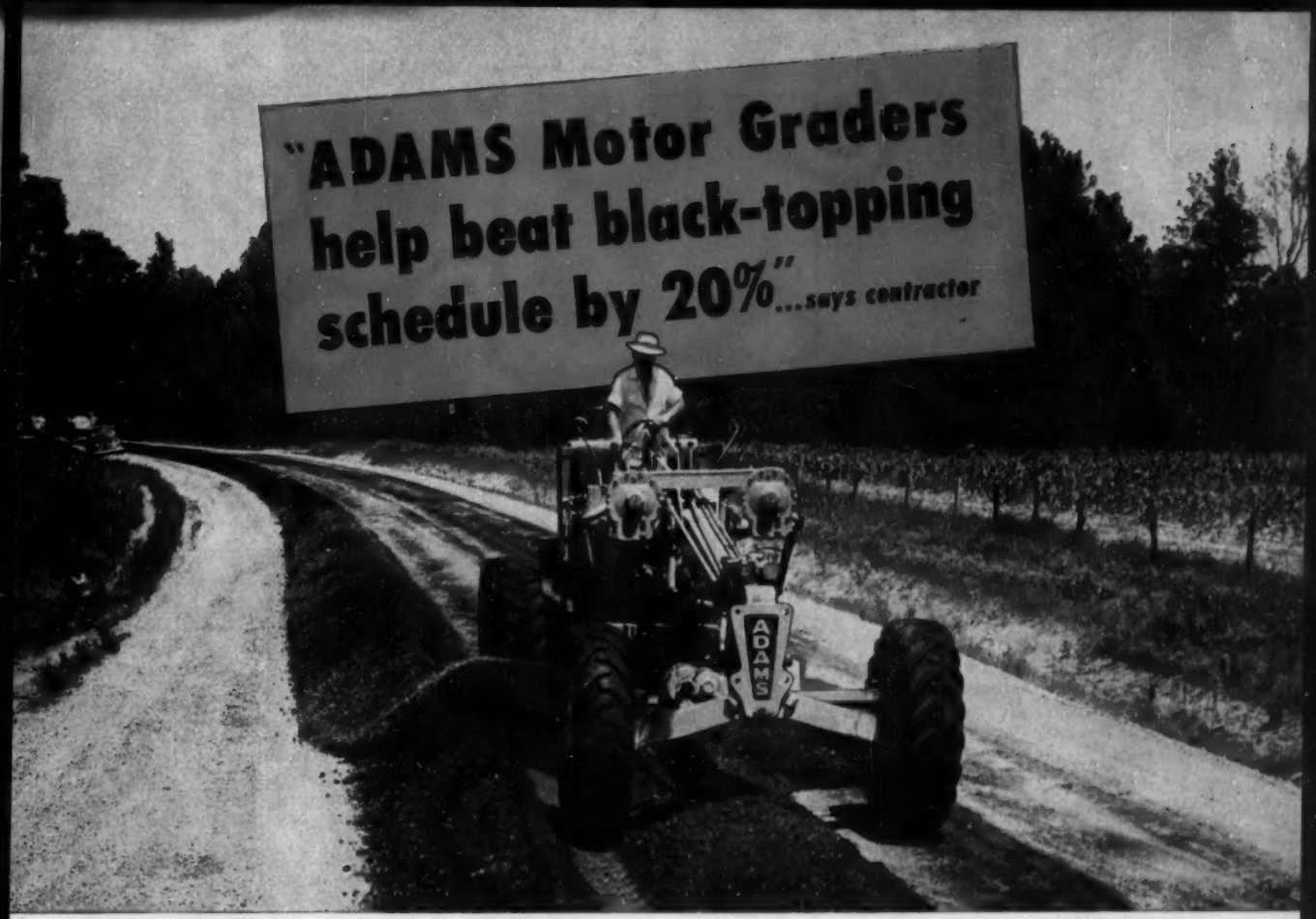
Transit-Mix vs Central-Mix

• **Transit-mix plants** generally will be found to:

1. Have a lower first cost
2. Require less head room
3. Have lower plant operating costs
4. Show a higher production rate for the same size batcher.

• **Central-mix plant** advantages include:

1. Better control of concrete through:
   a. Rigid and accurate control of water and moisture content of aggregates
   b. Control of the consistency of concrete
   c. Better control through centralization of responsibility
2. Larger payloads per haulage unit
3. Less build-up in haulage units
4. Allow use of low cost dump-type haulage units. *(Continued on page 112)*



On the job shown above, Freshour Brothers, prominent Arkansas contractors, are using 100 hp. Adams Motor Graders for mixing and spreading 11 miles of black-top.

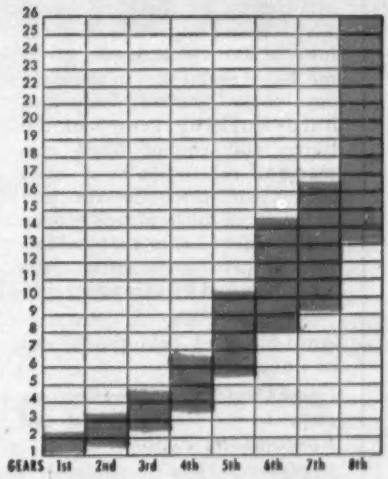
Mr. Dwight Freshour, partner and superintendent, says of these machines, "The power and speed of our Adams Motor Graders helped us complete this job 20% ahead of schedule."

The reason that Freshour Brothers, and other contractors, get this kind of schedule-beating performance is because Adams Motor Graders provide 8 overlapping forward speeds—not just 6, as in most machines. This range gives you an *exactly right speed* to do every type of work at the fastest practical rate. You can do a given job faster or do more work per day. And, you go from job to job faster, too—up to 26 mph.—and that saves productive time.

Let your local Adams dealer demonstrate how these machines will save time and cut costs for you.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.

8 overlapping forward speeds



ADAMS

Motor Graders TraveLoaders Pull-Type Graders

COMMENT
from the
BUTLER ENGINEER

. . . of Taconite and Women's Names

Made a most inspiring trek into the vast iron country of northern Minnesota. Five companies are spending *800 million dollars* in an enormous development to mine taconite. Always thought taconite was a low grade, unprofitable iron ore. 'Tain't so. It's just difficult to get at and get out.

Anyway, they're building a new town to house 10,000 people and expanding another to house 5,000 more. Those projects will involve many hundred thousand yards of concrete . . . Now you've guessed the "why" of my visit. *Whenever there's concrete in your future you'll see the Butler Engineer looking at you in your crystal ball.*

This enormous development (and 800 million dollars is only the beginning) will change the economy of our country — and for the better. There'll be enough iron for a thousand years.

Noticed many of the towns in that sparsely populated area bear women's first names, such as Virginia, Effie, Ruby. Asked why. Won't repeat the answer here as directly as it was given me, but it seems that in the early days those bearded, lusty and hard-working gentry of the mines and timber liked moments of relaxation away from pickax or saw. Certain gay members of the feminine gender who ventured into that wilderness to provide relaxing roofs were honored by this geographical immortality.

Am I obscure? Take the "t" out of immortality.

Great Day! The orders that have come in for Ready Mixed and Roadbuilders Plants!

Recession? How do you spell a Bronx cheer?

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

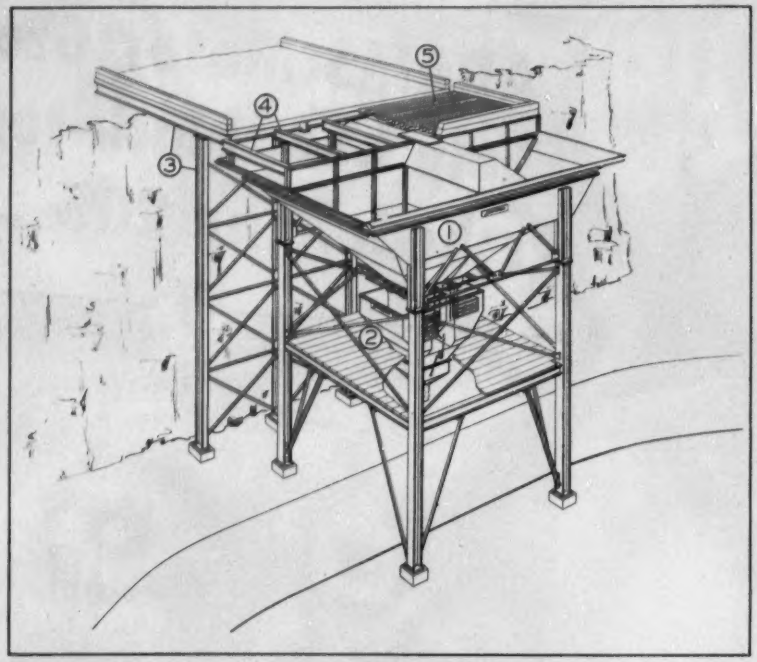


FIG. 1 . . . TRANSIT-MIX SETUP with ramp for truck-charging of bins, aggregates on the sides and cement in center compartment. Materials pass through batcher below into truck mixers.

5. Allow use of customer's own haulage unit.

The advantage of better control of concrete must be ever emphasized. Basically, in the central-mix plant, one man is responsible for maintaining a high quality of concrete, rigid control of the water cement ratio and rigid control of the workability of the concrete. The plant operator understands his responsibilities and accepts them. In most cases it is impossible to establish this feeling of responsibility among all of the many transit-mix truck operators or drivers. They think of their job more as a truck operation, a transportation job. They cannot be expected to think primarily in terms of the quality of concrete they deliver.

Because of the increased emphasis on the quality of concrete it may be that more and more of the new plants will be central-mix plants. The ability of the central-mix plant to supply concrete to those who have their own dump trucks and wish to use them is an important feature.

The use of special dump bodies in conjunction with central-mix plants is a very real advantage. There is a considerable saving due to the greatly reduced investment. These units do an effective job, provided concrete is of relatively low slump. Segregation occurs when the concrete is "souped up" to conform with the desires of the purchaser.

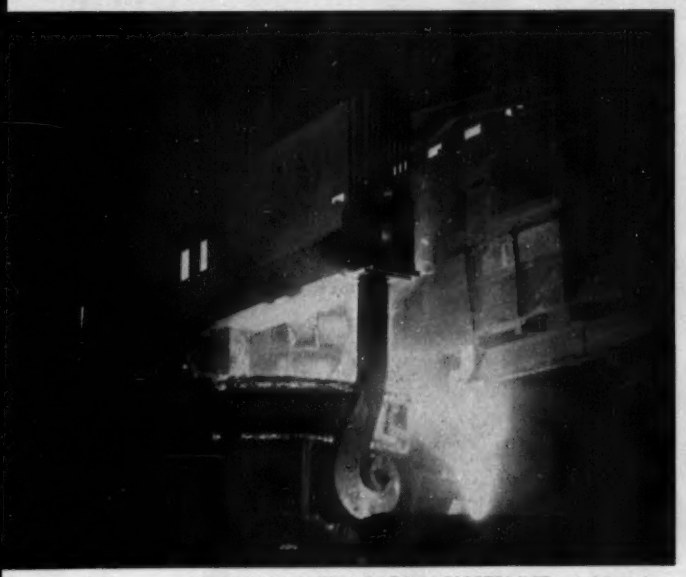
The recently approved standards for operation of truck mixers and agitators of the National Ready Mixed Concrete Association provide that the rated capacities of truck mixers shall not exceed 63¼% of the drum capacity for truck mixing, 70% for shrink mixing, and 80% for agitating. The higher percentage permissible for agitator operation contributes to making the central-mix plant operation more attractive.

Plant Arrangement

Highway and airport construction plants are quite likely to show great similarity. The reverse is true with ready-mixed plants. In their case the plant will be erected on a particular site. It is unlikely that it will ever be moved from that site. It can, therefore, be arranged to take advantage of and to fit in with local conditions which are peculiar to that site. Seldom are two plants alike.

Figs. 1, 2 and 3 show three different types of plant arrangements. It is not intended that this group be considered all-inclusive. There are other more or less typical arrangements which would have to be included if a complete

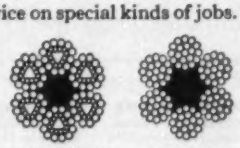
(Continued on page 116)



PROVING EXTRAORDINARY SERVICE—A Hercules Flattened Strand crane rope delivered 18 months service, compared to 6 months for ordinary rope. It performed equally well as a clamshell bucket rope. On a hot ladle crane it outlasted round strand rope by 4 to 1, and still tested at higher-than-rated strength. It was chosen for its super strength to haul the car on the continent's largest cableway at Kitimat.

Can Flattened Strand solve your special wire rope problem?

Hercules Flattened Strand is a special kind of wire rope that provides extraordinary service on special kinds of jobs.



Flattened Strand Round Strand

The key to the difference is the triangular shape of the strands. Notice how the strands support each other; how the rope circumference is almost perfectly round; and how the core is smaller. There is 10% more steel in Hercules Flattened Strand than in round strand ropes of the same diameter. That means *10% more strength* and *10% greater safety.* Flattened Strand wears longer and more evenly . . . and is easier on sheaves and equipment.

If you can use this Super-rope, you'll soon begin saving time, labor, money. Why not investigate?

Because Leschen pioneered and perfected Hercules Flattened Strand wire rope, Leschen is your best source of additional information. Ask your Leschen man, or write for "The Flattened Strand Story."

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The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
St. Louis 12, Missouri

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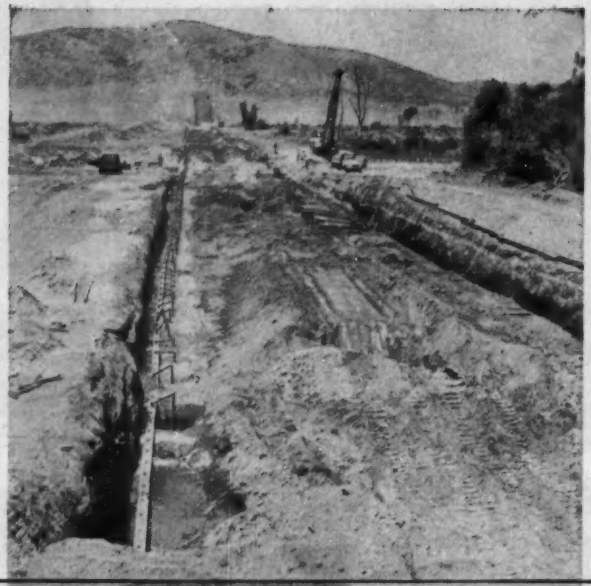
HERCULES Red-Strand
WIRE ROPE

WET

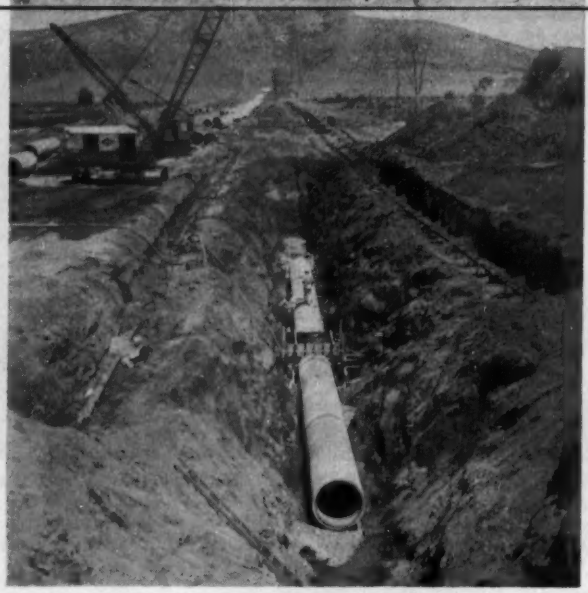
The quicksand is being predrained by efficient operation of Stang Wellpoint System.



to

DRY,

Excavation progresses in the dry. Pipe laid safely on schedule, with no ground water worries.



and

WHY!

U.S. Bureau of Reclamation engineers were faced with a challenging problem on the San Diego Water Supply Project. The San Diequito River Crossing of the San Jacinto-San Vicente Aqueduct called for the laying of 2,000 feet of large diameter concrete pipe in unstable water-bearing soil. Maximum depth was 18 feet below ground water table. After consultation with Stang engineers, a wellpoint system was expertly installed to predrain the work area. Digging "in the dry," the job progressed speedily and economically. Pipe was easily laid as planned. Call on Stang experience and equipment to solve *your* water handling problems—any size, any type, anywhere. 84-page catalog furnished free upon request.

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CP* TAKES SCREEN TEST

Winslow Discovery Stops Sludge Show!

Oily Critics Amazed by Performance!

GETS TOP BILLING IN FILTER FROLICS

by hedda lettuce

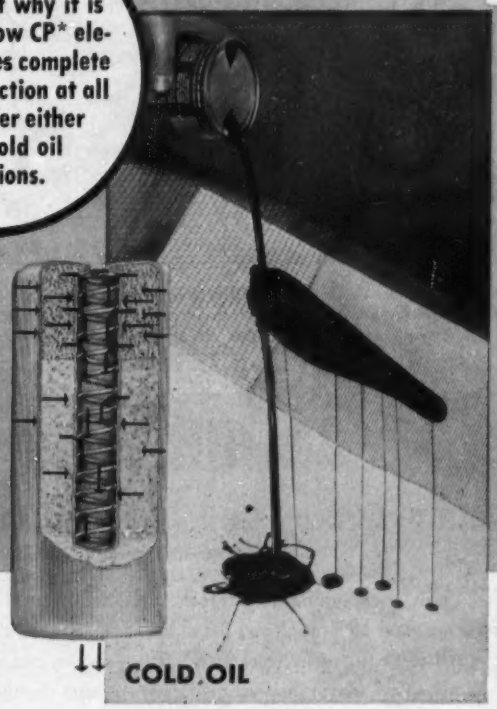
EMERYVILLE: Folks around here are talking about the sensational performance of "Cee Pee", the latest Winslow discovery who went before the cameras yesterday and came out smelling like a filter with a job well done.

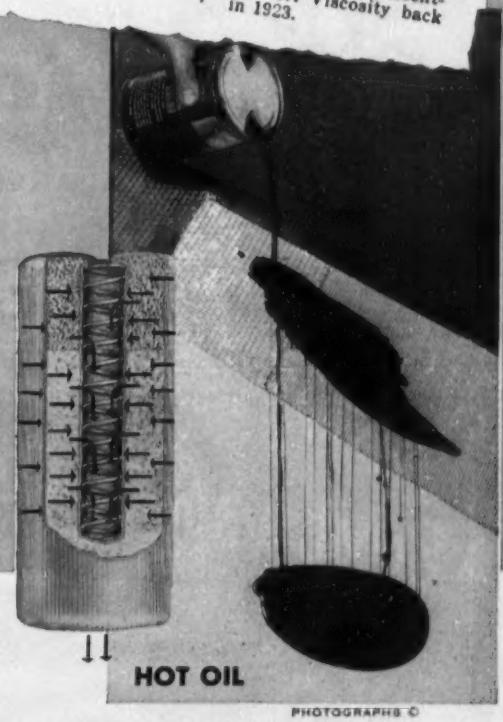
Prior to yesterday's test there were those who doubted that "Cee Pee" had the stuff it took to be a star. But there's no doubt now.

"Cee Pee" handled her oil lines perfectly. Pressure didn't bother her. Not once did she find it necessary to open her bypass. It was a real Three-D performance—filtering, cleaning, and protecting.

It looks like a long term contract for "Cee Pee" with the industry. No one here has seen anything like her since Cecil B. DeMillwheel presented Veri Viscosity back in 1923.

You can see for yourself why it is that a Winslow CP* element provides complete engine protection at all times, under either hot or cold oil conditions.





PHOTOGRAPHS ©

Cold oil is poured over both portions of the screen. As can be seen the entire surface passes oil, with the majority going through the less dense section. There is no excess left.

In a Winslow CP* element there are also two sections, one more dense than the other. The less dense section is a very small portion of the entire assembly(1). Under COLD OIL conditions the Winslow CP* element reacts exactly as is shown in the screen test.

Under pressure the cold oil is all filtered. Dangerous particles are filtered out so that the engine is protected even under COLD OIL conditions. There is no unfiltered oil left to activate the by-pass. In a Winslow CP* element the by-pass acts *only* as a safety valve.

Under HOT OIL conditions the Winslow CP* element reacts exactly as is shown in the screen test. The less dense portion is still filtering some oil but the dense portion is taking more and more—automatically controlling pressure losses, as oil viscosity dictates.

Under HOT or COLD oil conditions *complete filtering of all the oil* is assured for within a single full-flow element the Winslow CP* performs as both a full-flow and a shunt filter.

(1)Strict field and lab tests have proved that even the less dense section of a CP* element will remove all particles of a harmful nature.

WINSLOW FILTERS

*FULLY PROTECTED BY PATENTS AND TRADEMARKS

Winslow Engineering Company **4069 Hollis Street · Oakland 8, California**

CONCRETE . . . Continued from page 112

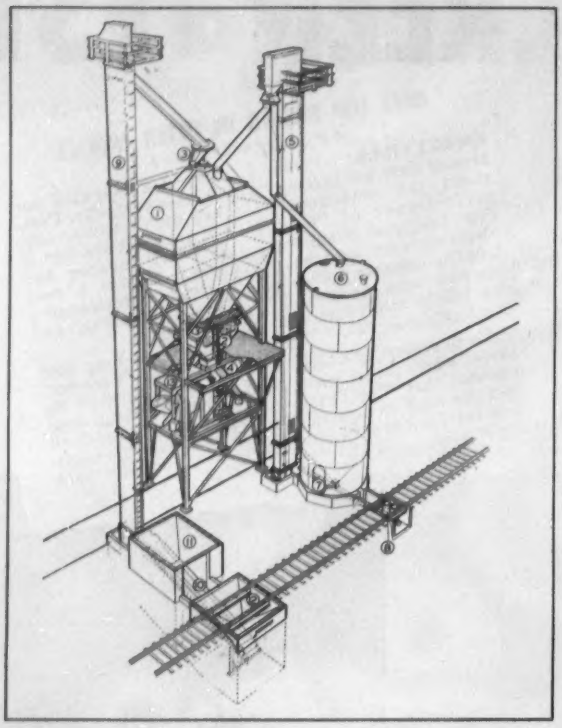


Fig. 2 . . . FOR CENTRAL-MIX. Aggregates and cement are delivered to plant by rail on one set of tracks. Output of plant could be increased materially by installing a second siding.

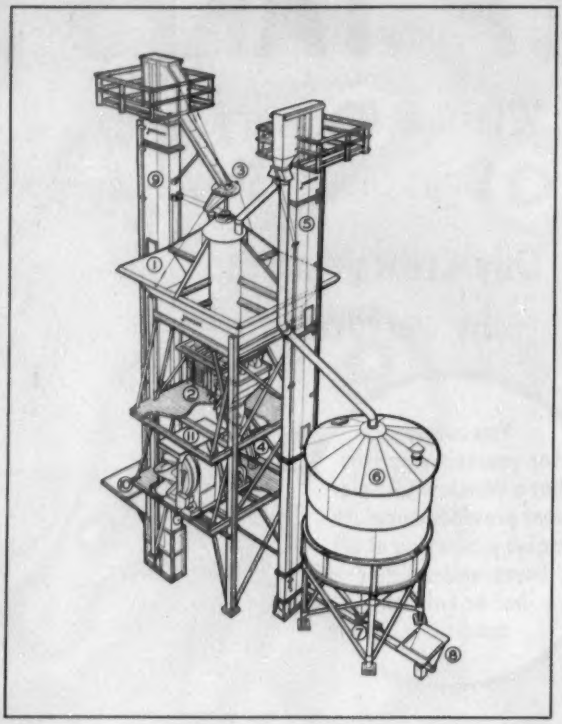
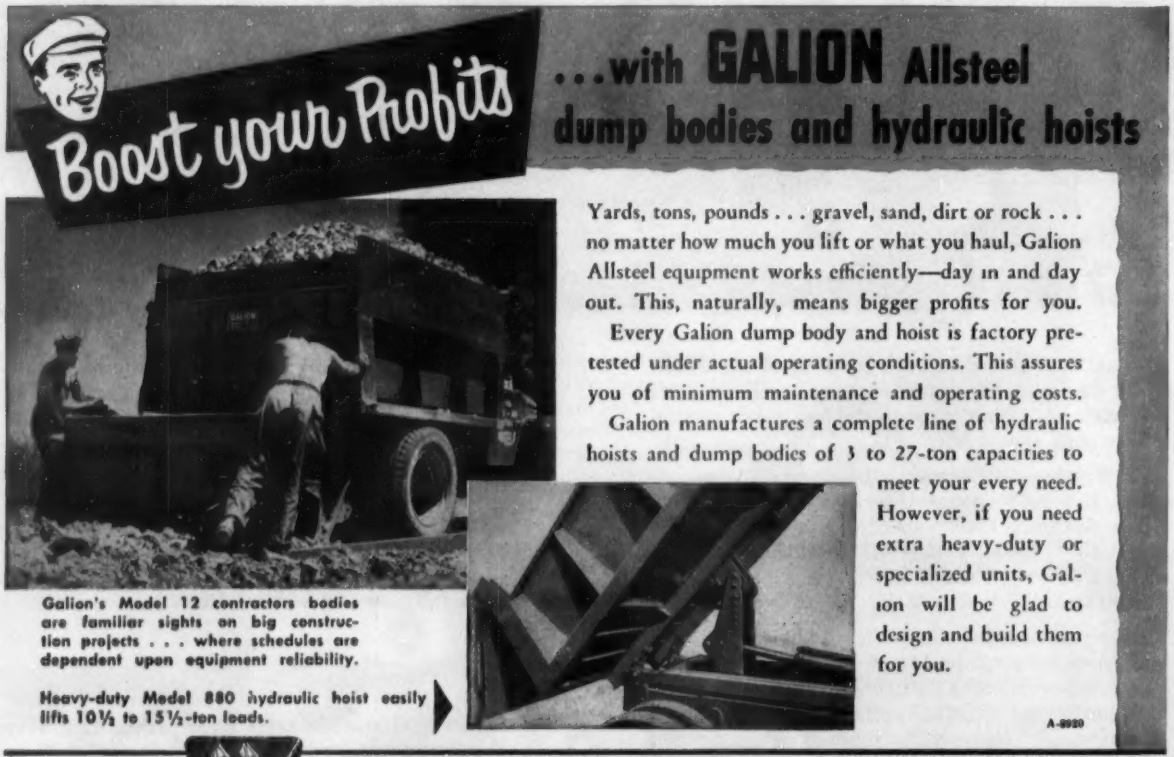


Fig. 3 . . . OPPOSITE SIDE UNLOADINGS are featured in this arrangement for truck delivery of cement and aggregates. There is ample room on each side for trucks without delaying one another.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Galion's Model 12 contractors bodies are familiar sights on big construction projects . . . where schedules are dependent upon equipment reliability.
Heavy-duty Model 880 hydraulic hoist easily lifts 10½ to 15½-ton loads.
A-8920
THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

group of ready-mixed plants were to be assembled.

Fig. 1 shows a transit-mix setup with a ramp for charging of the bin. In this plant aggregates and cement are delivered to the bin by trucks. Aggregates are dumped into their proper compartment, and cement is charged into the central cement tank through the hatch on top. A conventional multiple material batcher is beneath the bin. The materials are discharged directly into truck mixers which pass under the bin.

Fig. 2 shows a typical setup for central-mix operations. In this case both the aggregates and cement are delivered to the plant by rail. This plant cannot be expected to have a high daily production because there is insufficient room on the siding to permit unloading many aggregate and cement cars each day. The output of this plant could be increased materially by using a second siding.

In the plant of *Fig. 2* aggregate is dumped from the railroad car into a pit and carried by a short belt feeder to the boot of a bucket elevator. From the bucket elevator the aggregates flow to the pivoted distributor at the top of the bin which directs them to the proper aggregate compartment.

Cement Handling

Cement is discharged from a cement car into a screw conveyor which conveys it laterally to the boot of the cement elevator. The elevator raises the cement, discharging it into either one of the two pipes. One pipe directs the cement to the cement compartment of the bin, while the other pipe directs it to the auxiliary ground storage silo. Cement from this silo is reclaimed by the same screw conveyor which used to unload cement cars. Beneath the bin is shown a conventional batcher and mixer of the non-tilting type. Truck agitators or dump trucks are driven underneath the bin on the road.

Fig. 3 is another typical arrangement for a central-mix plant. This plant is arranged to receive aggregates and cement by truck delivery. It should be noticed that the unloading facilities for the aggregate are located on one side of the bin, while those for cement are on the other side of the bin. This arrangement is excellent because it provides ample room for drivers to maneuver their trucks.

In plants designed for a much higher daily production than those

(Continued on page 120)

For all types of industrial equipment . . .

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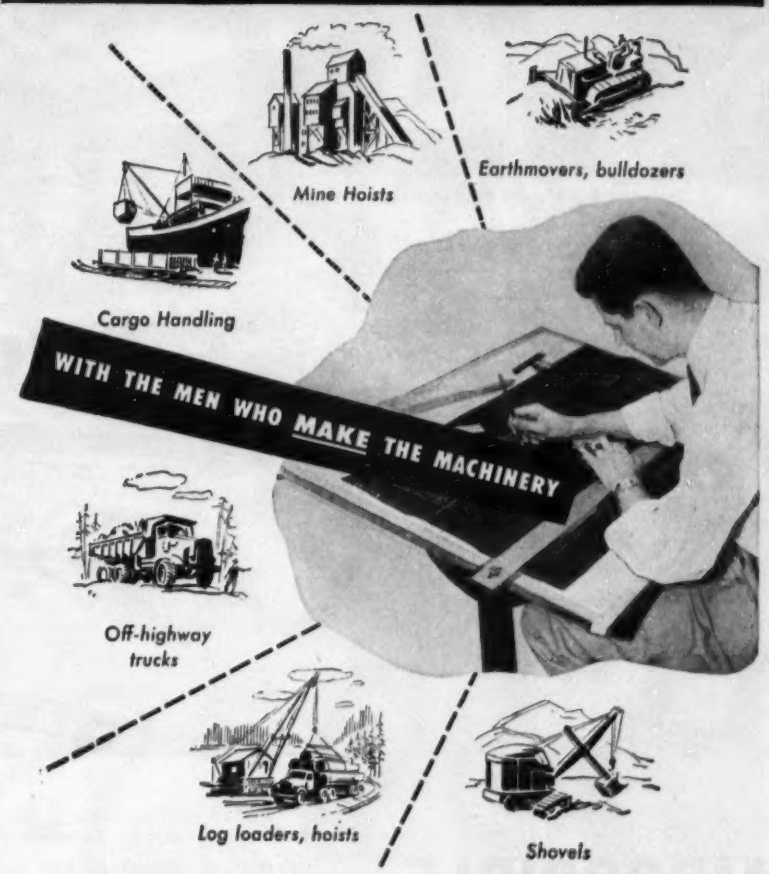
ASBESTOS
Friction Materials
are first choice!



There are plenty of good reasons why J-M Asbestos Friction Materials are standard equipment with most manufacturers of heavy duty earthmovers, draglines, cranes, etc. The asbestos base in J-M Friction Materials withstands terrific friction-created temperatures. Machines can take heavier loads at faster speeds. Starts are smoother, stops are sure and safe. The extra-long life of J-M Friction Materials cuts maintenance costs, too. And smoothly braked machinery stands up longer. For detailed information, write Johns-Manville, Box 60, New York 16, N. Y.

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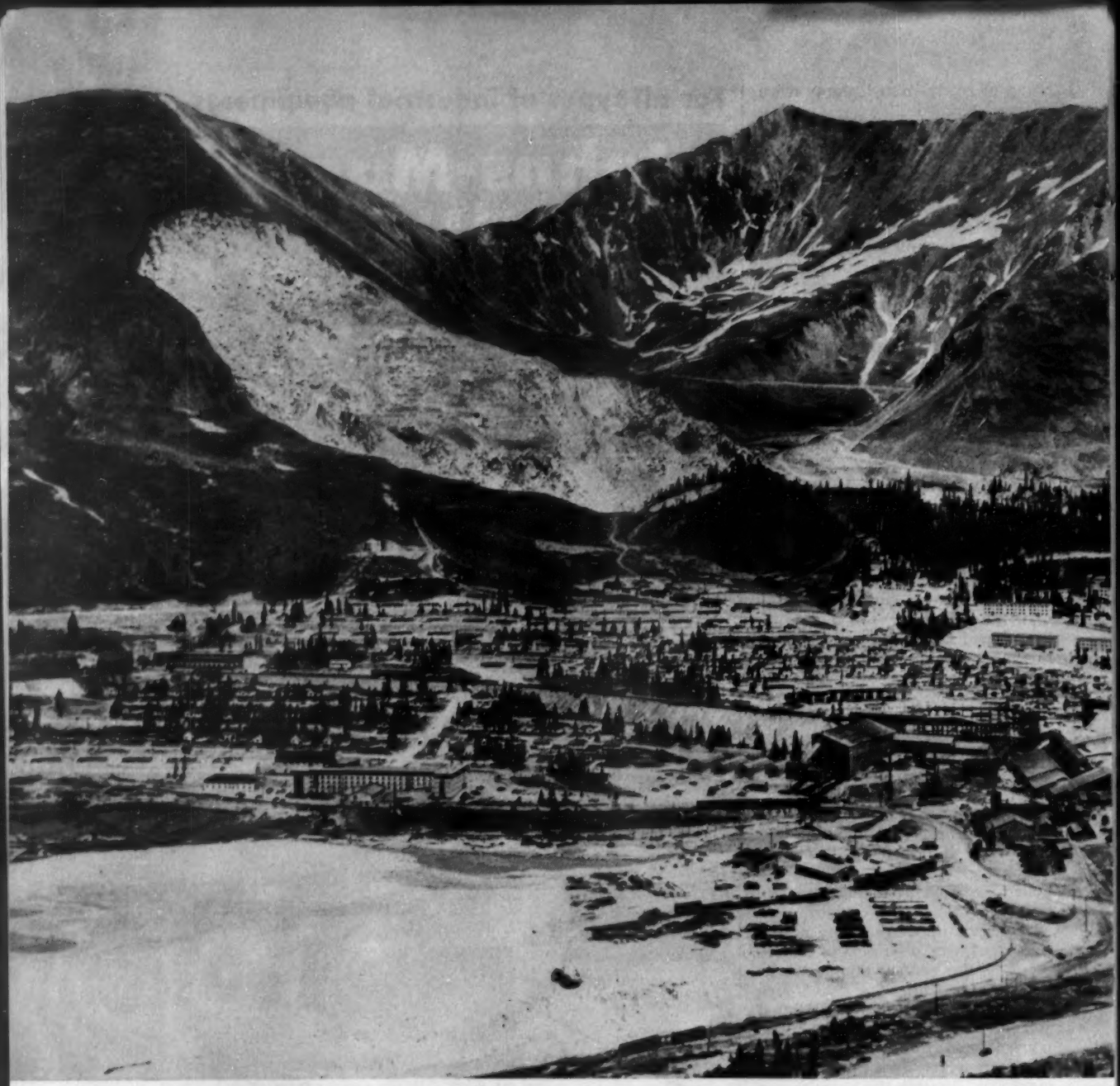

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For 40 years, the development, manufacture, and practical application of explosives have been Hercules' business. Our representatives welcome the opportunity to consult with you on blasting problems.

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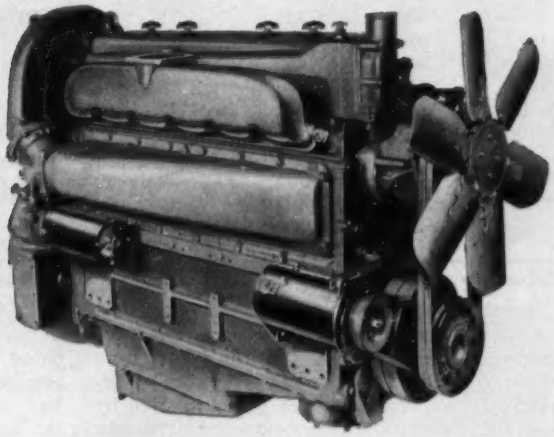

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Now you can get the power you need—and the increased production you want—with a new 300-horsepower General Motors "110" Diesel—the engine that delivers more torque in the working range. And, you can get them with no increase in engine size or weight.

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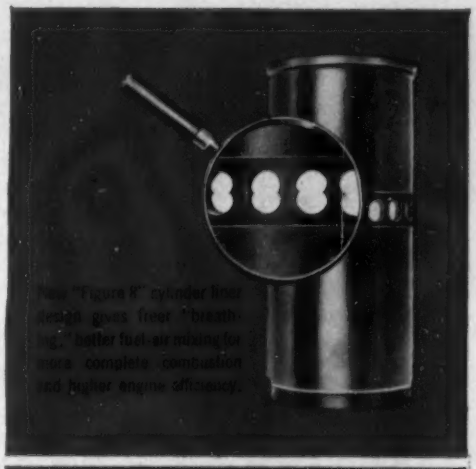
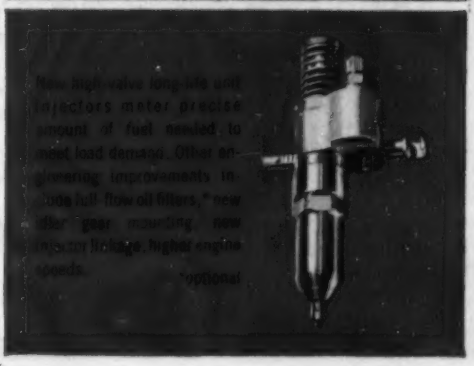
In tractors it means more power for pulling, pushing or "dozing."

Get full details on the new, more powerful GM Series 110 Diesels from your GM Diesel distributor. Have him show you that GM Diesels cost less to buy, less to run and less to maintain than any other Diesel.





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Single Engines . . . 16 to 300 H.P. Multiple Units . . . Up to 864 H.P.

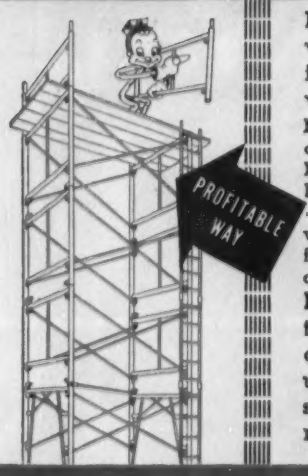
Table 1 . . . Recommended Bin Sizes

Concrete Production Cu. Yd./Hr.	AGGREGATE STORAGE				CEMENT STORAGE			
					Type I & II		Others	
	4 Agg. Compt.		6 Agg. Compt.		Overhead	Auxiliary	Overhead	Auxiliary
	Tons	Cu. Yd.	Tons	Cu. Yd.	Bbl.	Bbl.	Bbl.	Bbl.
5	50	50	...	...	50	350 (1)	25	350 (1)
10	50	50	...	...	50	350 (1)	25	350 (1)
20	90	75	130	100	50	350	25	350 (1)
30	130	100	175	130	80	400	40	350 (1)
40	175	130	225	175	100	525	50	350
50	225	175	300	225	130	650	65	350
60	250	190	350	265	160	775	80	390
70	300	225	400	300	180	875	90	440
80	350	265	450	340	210	1050	100	525
90	400	300	500	375	235	1200	115	600
100	450	340	550	425	260	1300	130	650
125	...	...	650	500	325	1625	160	800
150	...	...	800	600	390	1950	200	1000
175	...	...	900	675	460	2300	230	1150
200	...	...	1150	850	520	2600	260	1300

(1) Minimum storage recommended when delivered by railroad hopper bottom car. If delivery is by highway haul minimum can be reduced to 200 bbl.

just described, aggregate is delivered to the pivoted distributor by a belt conveyor. Auxiliary ground storage of aggregates should be an essential part of this type of installation. Cement unloading and handling facilities are similar, except that in this case we have provision for the storage of two different types of cement. The cement tank in the bin is divided by partition into two compartments. At the lower end of the pipe leading from the head of the cement bucket elevator to the bin is located a two-way valve to direct the cement to either one of the two cement compartments. A water batcher, located on the floor with the multiple batcher is desirable.

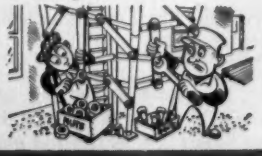
ADVANCE TUBULAR STEEL SCAFFOLD makes fast work of slow jobs



Building construction, maintenance and repair work of every type can be accomplished faster, more safely and at a definite savings when **ADVANCE** scaffolding is on the job. Manufactured out of heavy gauge tubular steel, it's designed for maximum convenience and low use cost. Each feature — self-contained, simple to operate Cam Locks . . . trigger action, panel attaching Stack Locks — is employed as assurance of user satisfaction. Little wonder that **ADVANCE** has achieved such definite field acceptance. It widens the profit margin on all overhead construction and maintenance work.

Beaver-ADVANCE products are available nationally for sale or rental through leading construction and industrial equipment distributors. Clip and mail the coupon for free descriptive literature and the name of your nearest dealer.

Can you afford those extra hours required for erection of unsafe wood scaffold or outmoded metal scaffold? Loss of lumber and attachment parts will push costs still higher.



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SAN CARLOS, CALIFORNIA

Size of Bin

Two major factors dictate size of the bin. These factors are expected concrete production in cu yd per hr and rate and dependability of the delivery of concrete materials.

The method of heating aggregates in winter, if winter-time operations are part of the program, and the number of special aggregates which are to be handled will have a lesser effect on the size of the bin.

It will be remembered from earlier chapters that the four most generally accepted means of aggregate handling were by clamshell bucket, bucket elevator, belt conveyor and, for those fortunate enough to have a hillside site, direct charging of the bin from a truck ramp. Charging by clamshell bucket, while extensively used for the portable plants, is used only for the small plants in the ready-mix business.

The bin must be large enough so that each compartment will hold material sufficient to supply all the requirements for that size during the time that the other compartments are being recharged. In establishing the size of the bin on this basis the time lost in switching from one material to another, the likelihood of short interruptions and, in the case of a ramp-charged bin, the regularity and dependability of truck delivery must be considered.

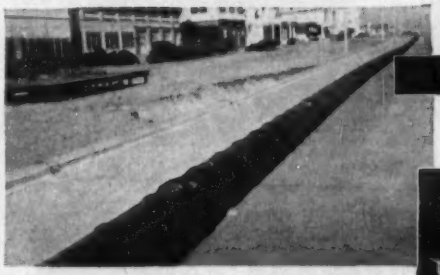
Bin sizes *(Table 1)* are those recommended for various rates of concrete production. Values given in the table will apply for average operating conditions for bucket elevator charging, belt conveyor charging or ramp charging. Any unusual factors expected in a particular plant should be used to modify these recommendations.

Number of Bin Compartments

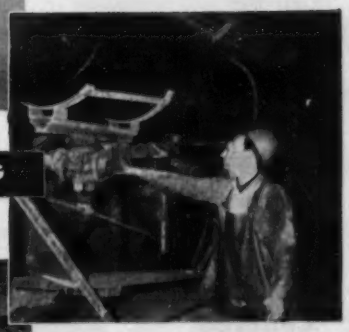
Table 1 on bin sizes provides for four and six aggregate compartments. The bin with six compartments is recommended. It allows the plant operator to furnish the special concretes in demand today—and their use may be expected to increase. It is costly to modify a three- or four-compartment bin so that more materials may be stored in it. It is impractical to plan operations so as to empty one compartment of a particular material to allow storage of a different material.

Realizing that finances and other considerations may not allow the selection of a six-compartment bin,

A DEMON FOR WORK



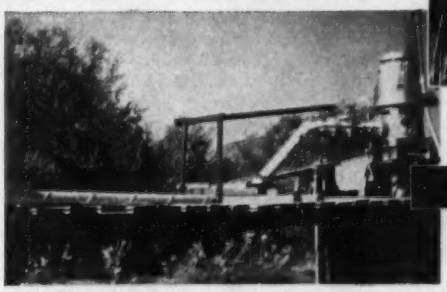
DREDGING



VENTILATING

HYDRAULICKING

WATER



IRRIGATING

Naylor is the one lightweight pipe with the built-in extra strength that makes light work of jobs like these in the construction field. It's a demon for heavy service even though it is light in weight. The distinctive Lockseam Spiralweld structure makes the difference. The lockseam carries the load—the spiralweld seals the pipe to make it leaktight. You'll like its easier handling and faster installation with Naylor one-piece Wedge-Lock couplings. For the complete story, ask for Bulletins No. 507 and No. 513.

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Table 1 also is designed to show the minimum recommended storage for aggregates in a four-compartment bin. Storage figures given are based on providing 2-hr storage for three materials, the fourth compartment being reserved for a second size of sand or other material less commonly used. The fourth compartment, while it is deemed to be highly essential, merely adds 33 1/3% to the basic minimum storage for sand and two aggregate sizes so commonly used in ready-mixed concrete.

If all the compartments of the four-compartment bin are made of equal size, there will not actually be 2-hr storage of materials because in the usual mix of the sand and two aggregates, considerably more sand is used than either of the two stones or gravels. This means that, unless the compartments are not all the same size the theoretical 2-hr storage of materials will not be achieved. This factor should be of little concern except where there is a breakdown of aggregate handling facilities, for it is possible to arrange the charging procedure so that sand may be kept in ample supply.

Storages recommended for a six-compartment bin have been based on a minimum of 2-hr storage for three of the aggregates, an additional compartment of the same size for the fourth, and two additional compartments of approximately one-half that size for the fifth and sixth materials. It is believed that this compartmentation is most likely to meet the requirements of the average ready-mixed plant, especially for the less commonly used aggregates.

Anyone considering the purchase of a new plant or expansion of existing facilities should give careful consideration to the selection of a six-compartment bin. While it may seem that the additional compartments will be of little value, it has been the experience of those who have plants with six aggregate compartments that the additional compartments have been quite valuable.

Aggregate Ground Storage

Seldom is it desirable to set up a ready-mixed concrete plant without providing for auxiliary storage of aggregate materials on the ground. The ramp-charged bin with a highly dependable truck delivery of aggregates is an exception. Changes in demand and other factors make auxiliary ground storage a *must*. Lack of space may dictate that ready-mix operations be carried on without auxiliary storage but, unless operations are small and rather limited, it will be advisable to select another site.

How much auxiliary ground storage should be provided? There should be provision for auxiliary storage of a minimum of two days' requirements of each material. A week's supply of each material, stock-piled on the ground, gives the ready-mix operator greater insurance of smoother and more economical operation, more uniformity of materials so far as moisture content is concerned.

Aggregate Heating

Winter operations, except in the extreme south, require heating of the aggregates. The method most commonly used is to introduce steam into the bottom of the bin. This steam condenses on the stone particles, materially increasing the moisture content. For this reason, steaming of aggregate bins is a highly unsatisfactory operation. The one advantage of steaming an aggregate bin is that the materials can be heated rapidly, which means that not much material need be

(Continued on page 125)

(Advertisement)

HERE'S HOW TO RESTORE CONCRETE FASTER, BETTER, at LOWER COST!

BONDACTOR Concrete Gunning Equipment Pays Its Way All the Way!

PAID FOR ITSELF IN 90 DAYS! This portable rig, utilizing Bondactor and Mix-Elevator Equipment, and used by the Kentucky Highway Department to maintain concrete bridges in the state, paid for itself in 90 days.

Any way you figure it, a BONDACTOR is a wise investment! Why? Because this versatile equipment starts paying you back on the first job . . . and never stops! The secret? Versatility! Bondactor equipment can be used in so many ways to maintain, restore concrete, for waterproofing, stuccoing, cleaning of building interiors and exteriors, insulation, fire-proofing, wet and dry sandblasting.

Any of these jobs can be done more economically for you because Bondactor gets the job done for you faster, better, at lower cost!

Why don't you write, wire or phone to get all the facts, complete specifications and prices on the three Bondactor models. Please state intended uses and materials to be gunned. Do it now!

"THE ONLY WAY" to repair spalling on this Morgantown, North Carolina dam, according to Duke Power Company engineers, was with concrete shot from Bondactor equipment.

Air Placement
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1010 West 24th Street
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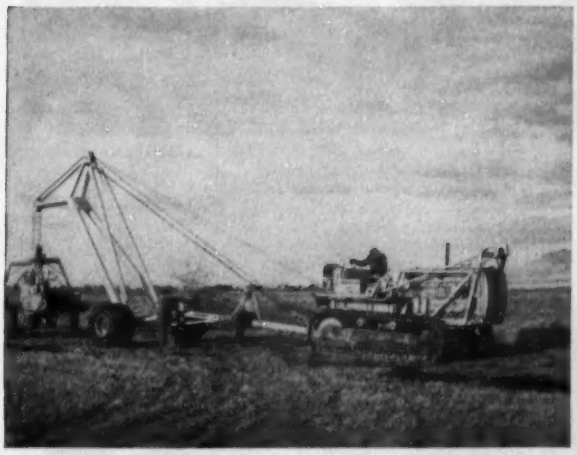
"Even in rugged Rocky Mountain weather, Du Pont anti-freeze keeps our downtime to a minimum!"

says ALVIS F. DENISON

"It sets me back an average of $45 every hour one of my machines is idle," says Alvis F. Denison, active Southwestern contractor. "So I go all out to keep downtime to a minimum. That means protecting my equipment with pre-mixed Du Pont anti-freeze." With "Zerone" and "Zerex" you can forget about freeze-ups.

"Pre-mixing saves us ¼ in anti-freeze volume," Mr. Denison says, "because a driver can install just the amount needed. He doesn't dump in a gallon each time he runs a bit low." Only Du Pont anti-freeze, with exclusive non-separating chemical rust inhibitor, can be safely pre-mixed with water to the protection required.



"Two miles above sea level—that's the elevation of some of our Rocky Mountain projects—where you see more eagles than people. Whatever the altitude, we've found that anti-freeze replacement due to evaporation is negligible—Du Pont provides a wide margin of safety even in coldest weather."

"There's some rust in *any* cooling system. But we know from draining our anti-freeze in the spring that Du Pont's chemical rust inhibitor keeps rust particles suspended in solution, so they drain right out with the anti-freeze. Our cooling systems never get clogged—and I've been using Du Pont anti-freeze for 18 years."

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...America's great money-saving anti-freeze value

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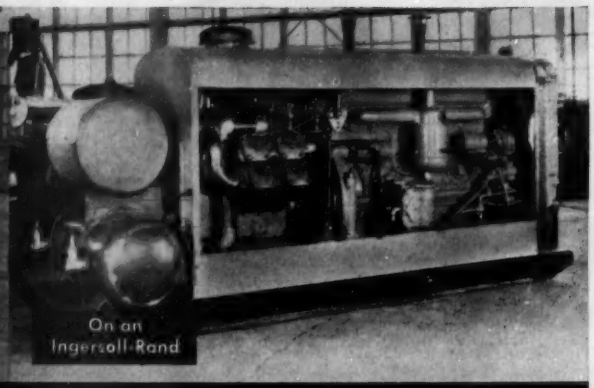

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CONCRETE . . .

Continued from page 122

held in storage to accomplish this purpose.

Because of the objections to direct heating by steam, some bins have been equipped with steam pipes to provide a closed system for the steam and condensate water, and excessive moisture is eliminated. This method of heating aggregates is not entirely satisfactory, either because of the high first cost to provide the large surface area required to transfer heat from the pipes to the aggregates or, because to achieve effective heating, the pipes must be exposed to the abrasion resulting from the flow of a large amount of aggregate over and around them.

Since neither of the two most commonly used methods of heating aggregates is entirely satisfactory, it seems likely that other methods will be developed. Irrespective of the method used, it is likely that to achieve effective heating of the aggregates, it will be necessary to retain them in the bin a minimum of from 2 to 4 hr. A lesser period of storage would require larger heating facilities.

One factor that works for smaller storage, so far as heating is concerned, is that the demand for ready-mixed concrete lessens in winter. Assuming that the other factors will establish the bin size, it is not unlikely that the storage interval, at the greatly reduced winter rate, will provide ample time to heat the materials properly.

Cement Storage

Cement should be stored in a compartment, tank or silo above the batcher so that it can be drawn upon either by gravity flow or by mechanical conveyor with little likelihood of interruption. It is generally necessary to provide some auxiliary storage because of the high cost of providing ample storage above the cement batcher.

The table of recommended bin sizes shows the recommendations for minimum cement storage. The table provides for a minimum storage of *Type I* or *Type II* cement, and a minimum storage for other types of cement, such as high early strength cement. This table has been built on the following assumptions:

1. A minimum of 2 hr of overhead storage for *Type I* or *Type II* cement.
2. A minimum of 1½ days total

(Continued on next page)

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Assurance of longer service life, with consequently lower replacement costs, recommends "HARDROCK" wherever severest drilling conditions call for a truly *super-strong* air hose.

The carcass is made of horizontally braided steel wires, providing exceptional strength, durability and resistance to kinking, without impairing flexibility. The long-lasting Synplastic tube is impervious to the action of oil from the drill. The cover is a tough, wear-resistant yellow rubber compound. A black spiral stripe gives the hose a distinctive appearance for easy identification. Sizes ½" to 2", inclusive. *Contact our nearest branch for details and prices.*

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cement storage for *Type I* or *Type II* cement.

3. A provision for storage of other cements of 50% of that recommended for *Type I* or *Type II* cement.

Type I and *Type II* cements are those most generally used by ready-mixed plant operators for a large percentage of the concrete produced. A ready-mixed plant also should have provision for the storage of at least two other types of cement or material which can be handled like cement, such as fly ash.

An operator supplying, in addition to his usual business, concrete for a highway project and for industrial or commercial construction which is being pushed forward at a rapid rate is quite likely to be supplying concrete made with a high-early-strength cement, and concrete made with cement which has been approved and reserved for the highway project. Experience seems to indicate that three compartments is the logical choice. On the other hand, an operator who has provision for four or five cements is likely to find that he could not get along with provision for only three.

Practically all pozzolanic materials are somewhat cement-like in texture and should be handled by the same type facilities. The increased use of these materials emphasizes the need for more than one "cement" compartment.

Maximum Production

The table of recommended bin sizes is based on the average hourly production of concrete. It does not mean that a bin of a particular size with corresponding facilities for the storage of cement will limit the hourly production of concrete to the figures shown in the first column. The contrary is true. For example, a four-compartment bin having an aggregate storage of approximately 225 tons, and aggregate handling facilities to recharge the bin at the rate required for a concrete production of 50 yd per hr, can be expected to produce concrete at a rate of 100 to 120 yd per hr for a short period of time.

At the start of each day's operation it is essential that the concrete be produced at a high rate until all of the haul units have been charged. During this time the plant will be living off its "fat," the large bin storage. This ability to produce concrete at a rate greatly in excess of the average hourly rate often will justify the purchase of a relatively large bin.

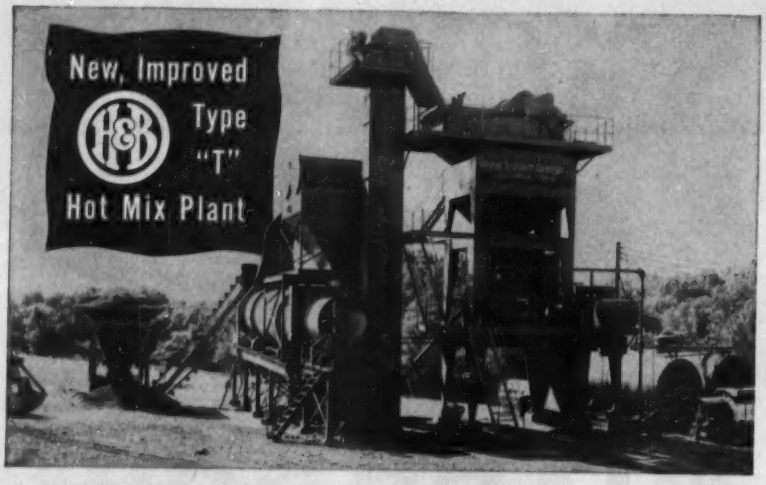
What size plant will be required to produce a desired concrete yardage? In attempting to give an answer to this we must select the type of haulage units and batchers, after which the size of bin, amount of cement storage, aggregate and cement handling facilities all will be selected so that the plant will consist of properly sized component parts. Selections should be made in that order.

That order has not been followed in these articles; it has been reversed. The parts or items have been discussed in the reverse order because the function of the various elements that must be understood before a logical or reasonable selection of the type of operation, the batcher and haulage units can be made.

Transit-Mix Operations

Table 2 "Batcher Capacities—Transit-Mix Operations" (Page 132) gives the approximate maximum output for the various sizes of multiple-material batchers likely to be used in a ready-mixed concrete plant. This table is based on

(Continued on page 132)



Increased Production—Lower Maintenance Costs

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LOWER COSTS*
HIGHER PRODUCTION
*Both original and maintenance
New Structural Design—All-welded bent plate construction.
Flat Screen—Adequate screening area on all sizes.
Self-Contained Dust Bin—Empties directly into weigh box, eliminating screw conveyor.
Trunnion Roll Drive—on dryer, eliminating vibration and reducing maintenance costs.

The new H & B Type "T" incorporates, in the basic plant, all of the major improvements of the past 20 years. New structural design and many exclusive features combine to make a plant that has already established outstanding records in both production and maintenance.

In addition to the features listed at the left, air controls and self-contained overflows are standard equipment on all Type "T" plants. No loose pieces to move or erect. 4 sizes—from 25 tons to 160 tons per hour—to meet your requirements. Available with electric, Diesel electric, Diesel or gasoline power. Factory wired plants available when electric power is used.

For specifications and complete information, write for Bulletin T-54.

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THE ENGINEER'S REPORT

DATA

LUBRICANT RPM Delo Oils

UNITS 21 Buda diesel engines

OPERATION Hauling ore

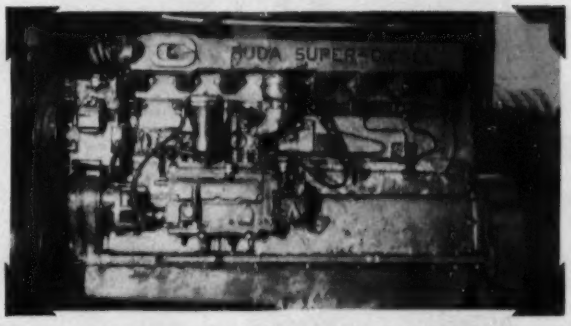
CONDITIONS Heavy duty — 8-15% grades

PERIOD 6 years

FIRM Bagdad Copper Corp., Bagdad, Arizona

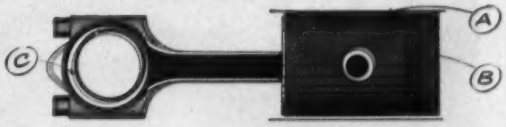
No stuck rings in 21 engines in 6 years hauling ore!

HAULING 22-TON LOADS up 8 to 15% grades out of the Bagdad Copper Corp. open-pit mine, 21 Buda diesels have had no stuck rings, no clogged ring grooves since using RPM DELO Special Lubricating Oil for the last 6 years. Engines operate 2 shifts a day, 6 days a week in heavy abrasive dust. Torn down after 7000 hours, all parts in the engine above were exceptionally clean and all bearings were good.



BIGGEST OFF-HIGHWAY TRUCK IN THE WORLD (above) was recently built for Bagdad Copper Corp. It weighs 96,000 pounds, hauls 75 tons. RPM DELO Special Lubricating Oil was also selected for its two 350 H.P. supercharged Buda diesels because of the excellent service Bagdad has had from this oil.

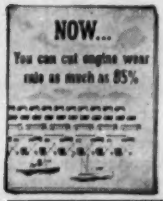
How RPM DELO Oils keep engines clean and prevent wear



A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.

C. Special compounds stop corrosion of any bearing metal, and oil foaming in both wet and dry sump engines.



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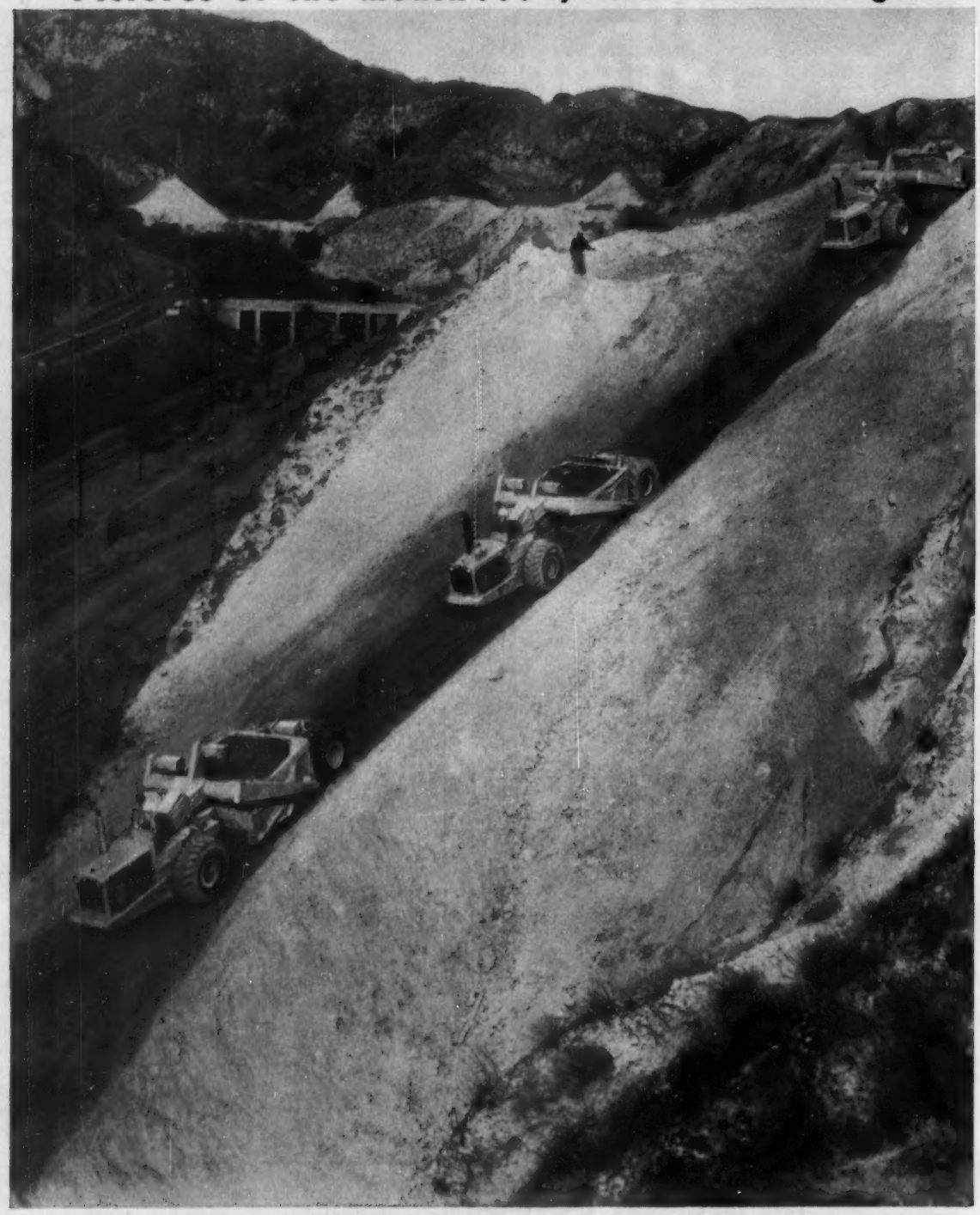
Pictures of the month . . . by LeTourneau-Westinghouse



12 mph, safely, down 35% grades

— Thanks to multi-disc air brakes that provide more braking surface on each wheel than most haul units have on *all four*, loaded Tournapulls here travel safely down 35% grades. Power kingpin steer, fast-acting electric controls, good visibility, 6 ft by 2 ft tires, all contributed to their safe, high-speed haul. Shown are 3 of the 8 C Tournapulls used by J. Tomei & Sons Construction Co, Van Nuys, Calif, to relocate Hwy 99 through Weldon Canyon, near San Fernando. Push-loaded with 13 pay yds of sand, clay and shale, each unit completed a 3000-ft. cycle every 5.5 minutes, despite steep grades. Combined hourly output for 8 "C's" totaled 1,040 pay yds.

(Advertisement)

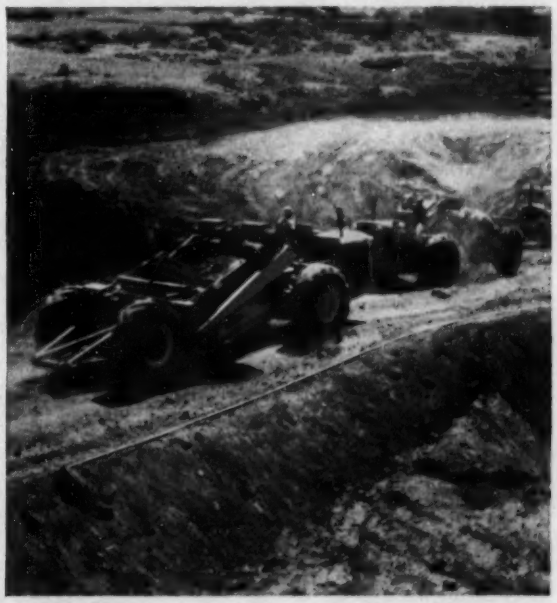
. . . with performance reports from around the world

Roadbuilding in 150° heat — Building a 250-mile highway through Arabia from the Port of Djeddah to the Mohammedan holy city of Medina, 3 Rear-Dumps haul crushed basalt and coral sub-base across the desert. Contractor T. W. Ward, Sheffield, England, says natives who had never been on trucks before learned to operate rigs' electric controls in a few hours.

1 tractor, 4 jobs — Tournatractor is the only tractor made which has the speed to do ALL dozing on a road contract. Producers Mining Co, Harrisburg, Ill. uses their Tournatractor for push-loading (above) . . . keeps 2 C Tournapulls "humping" on hauls as short as 250 ft one-way. It moves around job at 19 mph, clears stumps (below), levels windrows, places culverts, etc. Operator John Longmiere says it is "twice as fast as crawlers."

Root for less — To break up old pavement before widening Route 20, Asphalt Roadways Co of Buffalo chose this Rooter — the 5,500th produced by the LeTourneau-Westinghouse factory. Volume production made its price $300 to $500 lower than that of other nationally-marketed Rooters. On the job, it was pulled by a 148 hp crawler-tractor.

Now a field, soon a factory — 675 x 780 ft of fill will convert this hollow into a graded site for an Armed Services barracks fabricating plant near Harrisburg, Pa. Ritter Bros, contractors, use 2 Tournapulls to move dirt. The one above is a 7-yd, 122 hp "D", the other a 16-yd, 186 hp "C". Both have an exclusive differential to prevent cutting in on soft footing.



3 machines faster than 1000 men — It would have taken a thousand men 3 years to complete this 75,000-yd earthfill dam in Mysore, India. Even then, says the Engineer-in-Charge, compaction would have been inadequate. But 2 D Tournapulls moved all dirt, and a tractor-towed LeTourneau-Westinghouse Sheepsfoot Roller handled compaction to finish project in 3 months. On 1000 ft cycles, each 7-yd Tournapull made 28 trips hourly.

(cont'd on next page)

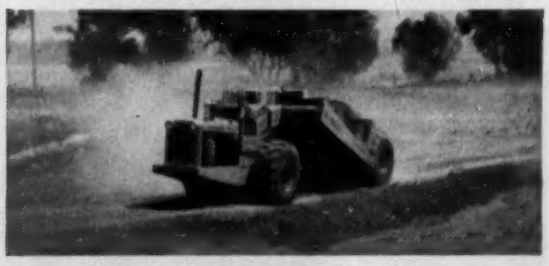
(Advertisement)

Pictures of the month . . . by LeTourneau-Westinghouse

219 tons overburden hourly — Hauling clay, gravel, and sand overburden from a silica pit in Wedron, Illinois, each of these LeTourneau-Westinghouse Rear-Dumps completes seven 3600' cycles per 50-minute hour. Despite 400 ft of 6 to 10% grades leading out of pit and 150 lbs rolling resistance on haul, the 3 units deliver combined total of 162 pay yds (219 tons) hourly. Says A. O. Anderson, foreman for Wedron Silica Co, Chicago, owners of the equipment, "These Rear-Dumps are easy on upkeep. Lubricating takes less than 10 minutes a day." Says Operator Oliver Brooks, "They're easy to handle. Brakes are fine, too."

Economical on 700 ft push — Replacing 2 crawler-tractors for Marietta Concrete Corp, Ohio, Tournatractor pushes sand and gravel 50 to 700 ft to dragline for loading. Dozing at 3½ to 8 mph, Tournatractor easily equals output of both the big crawlers which could work only at 1 to 2 mph.

Learn to operate in ½ day — In East Pakistan, a crew of unskilled laborers was hired to run 10 electric-control D Tournapulls for a 3,000 acre leveling job. After a few hours instruction and practice on these machines, they had learned operation sufficiently to be put to work. In fact, operators had grown so competent on fingertip controls, the 10 Tournapulls hauled and dozed all 1,332,000 cu yds involved "well ahead of schedule."



5 times the yardage — S. A. Cummings, Compton, Calif, reports 2 C Tournapulls hauled 21 loads (210 pay yds) of clay and silt hourly on 2800 ft cycles to terrace housing sites in Inglewood. "C's" moved 91% of yardage in 27 days . . . 30,480 yds each . . . compared to 6,040 yds for a crawler and 18-yd scraper.

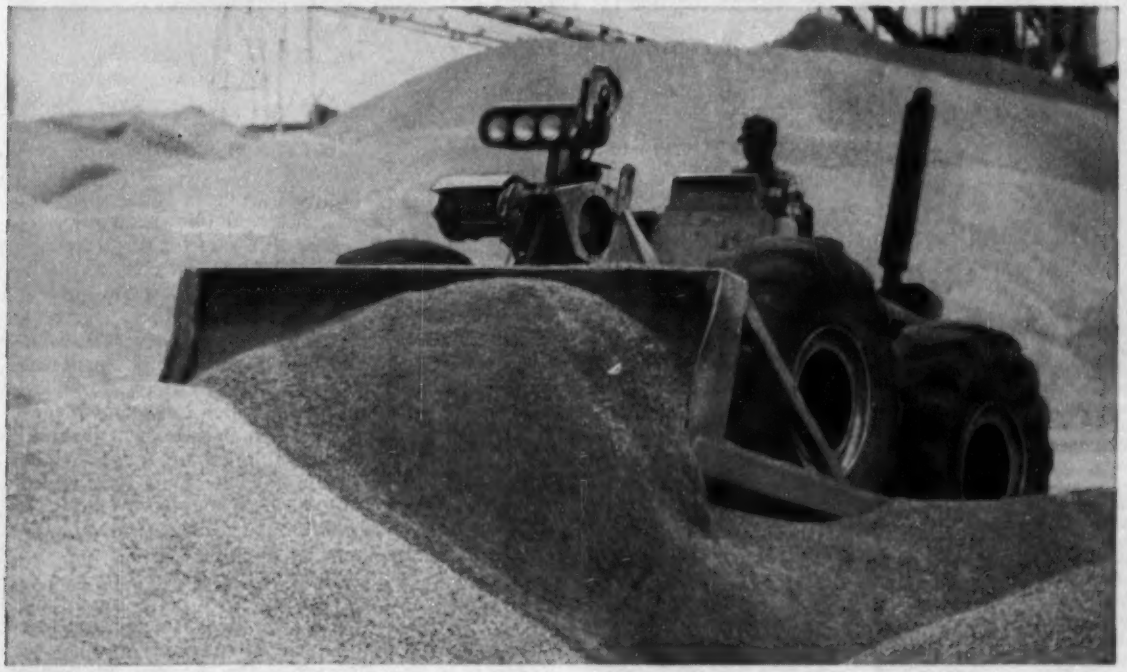
(Advertisement)

. . . with performance reports from around the world

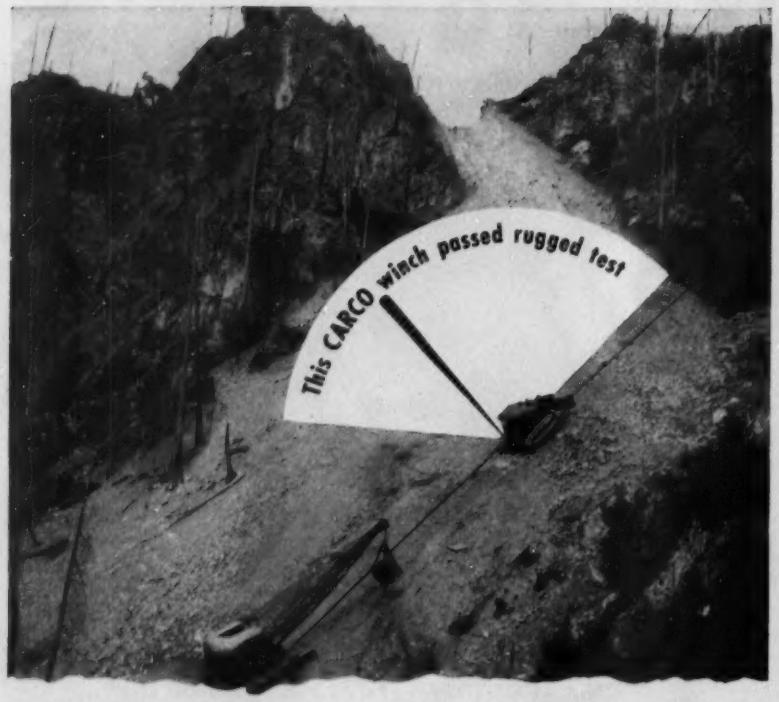
1 does work of 4 — "My one D Tournapull has replaced 3 trucks and a ¾-yard shovel on this job, and eliminated wages of 3 hired men," says Sam Coffman of the Bowie Sand and Gravel Co, Bowie, Texas. His 7-yd "D" strips the pit . . . selectively self-loads sand and gravel . . . stockpiles material.

Wheeled "race horse" — Like the horses which will run here at Vernon, N.Y., a 35 mph C Tournapull churns up clouds of dust on this 300,000-yd leveling job. "C" helped D. W. Winkelman Inc, Syracuse, level 240 acres for a ¾-mile track, 1500-car parking lot, and 4500-capacity grandstand.

11 months, 1,137,500 yds of dirt — In 11 months, 7 LeTourneau-Westinghouse Rear-Dumps (foreground above) and 12 LeTourneau-Westinghouse Bottom-Dumps moved 1,137,500 cu yds of river-bottom sand and gravel for the Inn River power project in Austria. Hauls varied from 1600 ft to 3 miles, one-way. When completed, this will be one of the largest hydro-electric plants in Europe. Over 5,100,000 yds of dirt will be needed for the 32,750 ft of levees which will line the reservoir. The main dam will be 920 ft long and 790 ft high — 60 ft higher than Hoover Dam in the U.S. It will provide 513,000,000 kw hours of energy yearly.



Tires outlast tracks, 4 to 1 — Because tracks on their crawler had to be replaced every 650 to 900 hrs, Miami Crushed Stone Co, Florida, bought this Tournatractor for stockpiling, other odd jobs. In 9 months, Tournatractor worked 3800 hrs — still had original tires. In 12 months, their crawler worked only 2600 hrs. Crawler lost hours for track repair; was often idle because it could not economically handle scattered jobs. Frequently, Tournatractor could get to job, do work, and return before crawler could travel ¼ mi. Tournatractor also boosted production . . . pushing sand 150 ft, it delivered 2 loads to crawler's 1. For more information on Tournatractor or other tools, write LeTourneau-Westinghouse Company, Peoria, Ill.



CARCO winches held fast when slippage meant disaster

... on tough Alberta to Vancouver pipeline job

Towing and holding heavy equipment on steep grades is a severe test of a winch brake. On the Model J Carco winch, the automatic, self-energizing brake will hold any load the winch can pull. It takes hold the instant tractor clutch is disengaged. Full braking power comes from high ratio leverage contracting the band on brake drum. Brake unit is reversible, permitting under- or over-wind free-wheeling. Brake release mechanism gives the operator complete load control at all times. The load can be checked at any point and even be "inched" down. Brake is enclosed, protecting it from the elements or external abuse.

Mr. G. T. Guest, Assistant to Project Manager of Comstock Midwestern, Limited, builders of "Big Inch-by-Inch", says, "The job needed Carco winches for towing and holding heavy machinery on steep grades and even for holding men by life lines. Had a single winch failed, men and machinery would have been lost. We found Carco winches equal to everything we asked of them."

On top of hill a Model J Carco winch is winching the Carco J winch and International TD24 shown above up steep slope at Coquihalla Canyon while it, in turn, is winching up clam digger.

You can expect greater value from the leading producer, and get it from Carco, first in winch production. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Wash. Branches at Portland, Ore., and Franklin Park, Ill.

WINCHES

FOR ALL INDUSTRIAL TRACTORS

CONCRETE . . .

Continued from page 126

the use of a manually operated batcher only. Because of the similarity of batching equipment found in an automatic ready-mixed plant and in a plant for mass concrete, discussion of automatic batchers will be deferred to a subsequent chapter.

It should be noted that probable maximum output for a particular batcher is tied to the haul units. Consider the time cycle for the operation of a multiple material batcher handling three aggregates —a type of operation encountered in highway and airport runway construction where the batcher discharges directly into a batch truck.

Table 2 . . . Batcher Capacities

TRANSIT-MIX OPERATION

TRUCK MIXER	MULT. BATCHER	CONCRETE
4 Yd.	2 Yd.	115 Yd./Hr.
4 "	4 "	128 "
5 "	3 "	120 "
5 "	5 "	132 "
6 "	3 "	124 "
6 "	6 "	134 "

NOTE: The 4-, 5- and 6-yd. truck mixers listed above are 3 ½- 4 ½ and 5 ½-yd. truck mixers respectively, each with the ½-yd. additional, as allowed by new truck-mixer standards.

In this case the material is discharged from the weigh hopper as rapidly as possible. A well-trained operator working with a 3-cu yd multiple could weigh up and discharge the materials for at least 240 yd of concrete each hour. The operator cannot be expected to continue at this rate for an 8-hr day.

The rate of 240 yd per hr greatly exceeds anything shown in *Table 2* since it is impossible to charge a truck mixer as rapidly as it is to discharge the materials from the weigh hopper. To arrive at capacity figures which have any meaning at all, it is necessary to build up the table on the basis of the batcher and the haul unit which are to be used together. *Table 2* is based on average operating conditions.

The table shows that larger haulage units have little advantage over the smaller. The reduced rate at which a truck mixer must be charged is the determining factor and explains why there is so little difference between the maximum production of a plant using a 6-yd truck mixer and one using a 4-yd

(Continued on page 134)

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on West Virginia Turnpike Project

Bates & Rogers Construction Corporation, Chicago, Illinois, have the contract for the only tunnel on the West Virginia Turnpike Project, which includes lining and flooring. It will be a two-lane tunnel, 2665 feet long and with a finished diameter of 36 feet. Work on this particular contract involves 25,000 cubic yards of open cut excavation, 91,800 cubic yards of tunnel excavation, 20,800 cubic yards of concrete tunnel lining, and the installation of permanent steel supports. Bates & Rogers also have the contract for the concrete footers and piers supporting the Four Mile Fork Bridge adjacent to the south end of the tunnel, and another contract for the flooring of this bridge plus two other bridges. As usual, this prominent Chicago contractor is getting smooth performance from every unit of equipment through the use of Gulf quality petroleum products.

ANOTHER important construction job where equipment is making an outstanding record of dependable performance with the help of Gulf Quality Products and Fine Service.

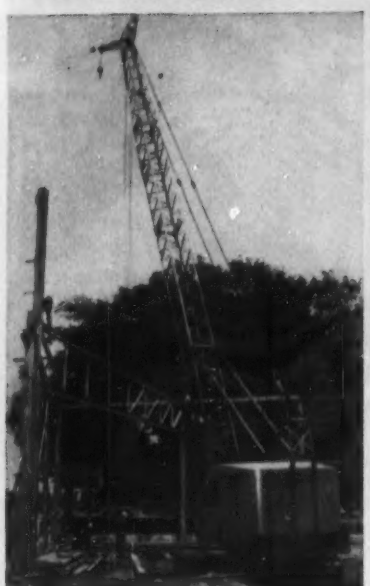
Here is why Gulf is the preferred supplier of petroleum products to so many leading contractors, like Bates & Rogers Construction Corporation, for example: Gulf lubricants provide an extra margin of protection—whether it is hot or cold, wet or dry. And Gulf fuels help insure full power.

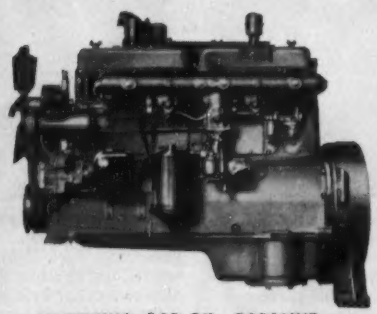
When Gulf quality products are combined with expert engineering counsel and prompt delivery service, you get a Gulf package that is bound to smooth the way to greater yardage and lower maintenance costs.

Gulf quality lubricants and fuels—and that Good Gulf Service—are quickly available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.

GULF

WAUKESHA
POWERED
for high output
maneuverability
transportability





WAUKESHA 140-GK—GASOLINE—
6-cyl., 4½-in. x 5½-in., 525 cu. in. displ.
Develops 99 net hp. at 1600 rpm.
Send for Bulletins

• Built to boost output as high as 25%, at lower cost per yard or ton, LS-98 keeps big jobs on schedule and turns small jobs into extra profit. Its Speed-O-Matic control and Waukesha Engine give the brute power and stamina to maintain faster working cycles without undue wear, working in the toughest materials and roughest situations.

WAUKESHA MOTOR COMPANY
Waukesha, Wisconsin
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248

CONCRETE . . .

Continued from page 138

truck mixer. It takes just about twice as long to charge a 6-yd truck mixer as it does a 3-yd truck mixer. From this we must not draw the conclusion that there is no advantage in using 6-yd units, for other factors are involved.

One of the major expenses in the operation of these units is the wages paid to the driver. Other things being equal, the most economical unit to operate will be the largest unit that can legally be used on the streets and highways over which the ready-mixed plant operator's trucks will run.

A ready-mixed plant owner may wish to have available smaller haulage units at those times of the year and for those jobs where soft roads or soft ground is likely to be encountered. There is, therefore, considerable justification for the use of more than one type of haulage unit.

Mixers

Stationary mixers used in central-mix plants are either of the tilting or non-tilting types. Until recently, practically all of the mixers in ready-mix plants were of the non-tilting type. Tilting mixers are mounted on trunnions which allow the whole drum to be tilted forward and downward, allowing the material to flow out of the drum into the receiving hopper. The non-tilting type has a drum which only rotates. This mixer is discharged by a discharge chute which can swing inside the drum. The pick-up blades inside the drum dump the concrete on to the chute. From the chute it flows into a wet batch hopper or guide chute usually provided to direct it into the concrete bucket or haulage unit. Non-tilting mixers have changed but little in the last 20 yr and are so familiar to the ready-mix operator that no further comments are in order. They have the advantage of:

1. Low first cost
2. Low operating cost
3. Lightweight, requiring a less costly supporting structural frame
4. Highly dependable

Tilters, which are used extensively in plants for mass concrete, have two marked advantages over the non-tilters. However, these advantages count for little in the average ready-mixed plant.

(Continued on page 138)

MICHIGAN *bucket control means "Bigger Loads . . . . . FASTER"*

Watch a MICHIGAN Tractor Shovel at work —with particular attention to bucket action —and you'll *see* how a MICHIGAN* will *handle bigger loads, move more yardage*—faster, at considerably lower cost.

- *Tremendous break-out power*—ram the cutting edge into any tough, hard-to-dig clay, shale or loose rock—and *work the bucket* to loosen it
- *Bucket roll-back at ground level*—pick up and transport full buckets at low center of gravity for safe traveling, no void space in the bucket; more work in less time
- *Remarkable digging ability*—two large double acting cylinders on bucket and two large double acting cylinders on main lift give excellent control and superior digging action.
- *Good bucket height and reach*—high dumping clearance and ample forward reach make trucks easy to load.

Check these outstanding Quality Features of MICHIGAN* Tractor Shovels . . .

1. **Superior Bucket Action**—bigger loads, faster loading
2. **Clark Power-Shift Transmission**—faster operating cycle gets more yardage
3. **Clark Torque Converter**—3-to-1 torque multiplication; power when needed—no conventional clutch
4. **Clark Planetary Axle**—relieves torque load on shafts and gears, prolongs machine life
5. **Power Steering**—much easier handling, lessens driver fatigue
6. **Gas or Diesel**—right power for the job; more horsepower than any comparable machine

Six models: capacities from 1 5 cubic feet to 2¼ cubic yards. Facts about the MICHIGAN Tractor Shovel are important—and interesting. The MICHIGAN Fact Folio contains specifications and action photos. The coupon gets it for you.

*A Trademark of Clark Equipment Company

CLARK EQUIPMENT

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CLARK EQUIPMENT COMPANY
Construction Machinery Division
380 Second Street, Benton Harbor, Michigan

Please send the MICHIGAN Tractor Shovel Fact Folio

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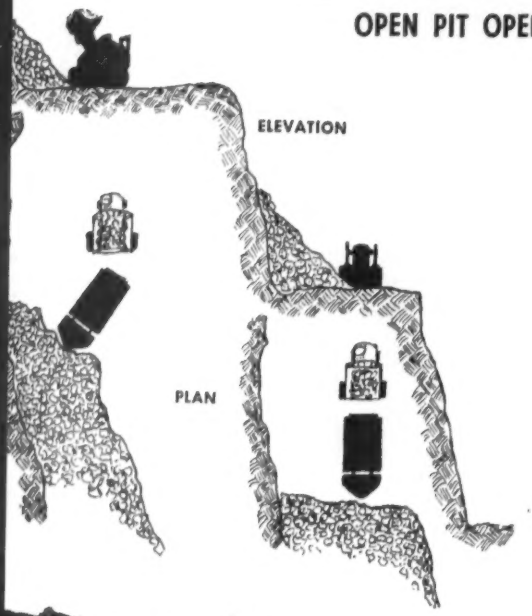
EIMCO

WORLD'S FINEST TRACTOR-EXCAVATOR

OPEN PIT OPERATIONS INCREASE PRODUCTION WITH SMALL INVESTMENT



Eimco 105 tractors with excavating RockerShovel attachment are being used in open pit mining with extraordinary results:

Loading time 6 yd. truck .....45-50 secs.

Average payload per truck .....10 tons

Based on 50 min. hr. and half minute switching time for trucks average hourly production.....400 tons

Exceptional loading in many operations has shown even greater tonnage figures where material handled was from stock pile and haulage traffic was not confined to narrow roadways such as encountered in benches of open pit systems.

Eimco 105's are in use by contractors in tunnels and on new construction, rock quarries, underground mining, steel mills and on many other jobs. Where speed and dependability are essential the 105 has proved to be the most rugged piece of equipment ever used.

The exceptional features of the 105 make it the finest piece of equipment of its type ever produced. The Unidrive transmission which contains all clutches and gearing for instant reversal, independent track control and gear changing without stopping are indicative of the new approach to heavy prime moving equipment.

The Eimco 105 final drive is another important design feature. The final drive unit (shown right) is composed of two separate units each of which is driven entirely independently of the other or the one may be driven in reverse of the other.

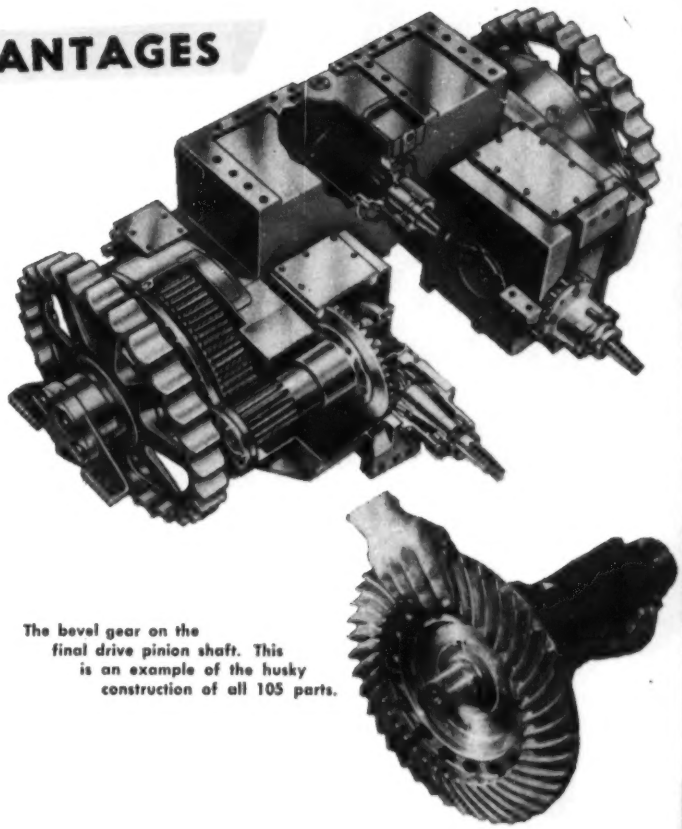
WITH COST SAVING ADVANTAGES

These final drives are each powered through matched pinion, ring gear sets through heavy, short shafts, husky pinions and gears. Even the short shafts are heavier in construction and larger in diameter than similar shafts used in any large tractor on the makert today. Shafts roll in Timken bearings that are separately caged for easy access, perfect alignment and long life. All clutches and brakes in final drive are eliminated. Gear cases are heavy alloy cast steel. Sprockets, gears and other parts are specially heat-treated for long service life.

Additional exclusive featuers include full oscillating tracks even with the excavator attachment. Easy simple controls, torque converter drive, full visibility with operator up front, all steel construction, clutches that never need adjustment.

These are the unique features that make the 105 the most maneuverable heavy tractor on the market.

We invite you to see, operate and compare the 105 with any other crawler prime mover. Write for information to The Eimco Corporation, P. O. Box 300, Salt Lake City, Utah, or to any Eimco branch.



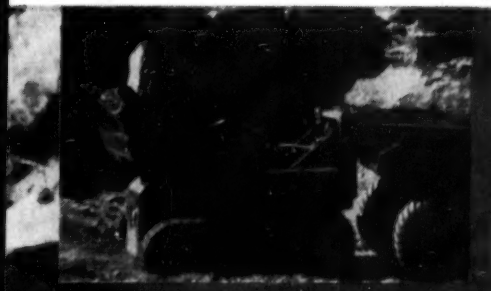
The bevel gear on the final drive pinion shaft. This is an example of the husky construction of all 105 parts.

Loading trucks on the pit bench. 105's maneuverability permits trucks to stay in close.

Huge boulders are pushed over side by 105 with excavator attachment.

The 105 picks up and loads larger pieces than can be handled by 1½-2 yard conventional shovels.

105 picks up load and waits for truck to position itself then —



A pull on the lever and over it goes. Heavy duty trucks can be loaded fast, with the bucket in high.

Less rugged equipment can be loaded easily with the bucket in low speed.

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TIFOR GRIPHOIST

CAPACITY 3300 LBS.
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TO 10 TONS WITH MULTIPLYING SHEAVES

UNIQUE IN ITS FIELD-WEIGHS ONLY 42 LBS.

Now—with the portable, manually operated, TIFOR GRIPHOIST you can do the work of winches, winch trucks, chain hoists and ratchet hoists. Thousands of these versatile machines have been ordered and re-ordered in the U. S. They're used by General Construction Contractors, Steel Erectors, Electrical Contractors, Truckers, Industrial Plants . . . wherever lifting and pulling must be done better and easier at lower cost.

EXCLUSIVE FEATURES:

UNLIMITED CABLE TRAVEL—NO REEL, NO SPOOL.

Easily carried, set up and operated by ONE man.

Speed—10 ft. per minute either direction, load fully controllable at all times. Uses ½" wire rope.

Any Position—vertical, horizontal, diagonal.

Safe—holds securely and automatically. Weighs only 42 lbs.

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Drummondville, Quebec, Canada

CONCRETE . . . Continued from page 134

Table 3 . . . Batcher Capacities

CENTRAL-MIX OPERATION

TRUCK	CHARGED	MIXER	MULT. BATCHER	CONCRETE
4¼-Yd Agitator	End	56S Non-Tilt	2 Yd	70 Yd/Hr
4¼- " "	Hatch	56S "	2 "	76 "
5- " "	End	84S "	3 "	72 "
5- " "	Hatch	84S "	3 "	80 "
6¼- " "	End	84S "	3 "	80 "
6¼- " "	Hatch	84S "	3 "	90 "
2- " Dump		56S "	2 "	65 "
3- " "		84S "	3 "	77 "
4- " "		112S Tilting	2 "	88 "
4¼- " Agitator	Hatch	112S "	2 "	89 "
4- " Dump		112S "	4 "	102 "
4¼- " Agitator	Hatch	112S "	4 "	109 "

The tilters are:

1. Capable of handling much larger size aggregate
2. Discharge much more rapidly than the non-tilters for the concrete is merely dumped from the mixer
3. Will produce more concrete per hr compared to a non-tilt mixer of the same size

When concrete is discharged from the mixer into a truck mixer, as is the case with central-mix plant operations, the rate of discharge from the mixer must be carefully controlled because the haulage unit or truck mixer cannot receive the material at a high rate. If the truck mixer is equipped with a hatch, and the operator elects to charge through the hatch, the truck mixer can be charged faster. Except where hatch charging is employed, there no advantage in using a tilting mixer in ready-mixed operations. Furthermore, large aggregates such as the 1- to 1½-in. and the 3- to 6-in. sizes, which are used in mass concrete operations, are much too large for ready-mixed plant operations.

Central-Mix Operations

The table "Batcher Capacities—Central-Mix Operations," *(Table 3)* gives the approximate maximum output to be expected of the multiple material batchers commonly used in ready-mixed plant operations. In this case, not only is it necessary to tie the multiple batcher in with the haulage unit, but it also is necessary to tie it in with the mixer installed in the central-mix plant. The table covers the combinations commonly encountered.

The quantities in *Table 3* are dependent upon several factors. Chief among these is the mixing time. ASTM specifications require 1-min mixing time for 1 cu yd plus 15 sec for each additional cubic yard or fraction thereof. This means that all central-mix plants, in order to save time, should charge the truck-mixer drums through the hatch, not "end-charge" them.

Even if end-charged, the maximum production rate for central-mix operations is less closely tied into the charging rate of the haulage unit than is the case in transit-mix operations. Mixed concrete can be charged into a truck mixer at a higher rate than can the batcher materials. There is a smaller volume for the same number of cubic yards of concrete involved.

Another interesting deduction to be drawn from *Table 3* is that remarkably high production can be achieved with a 4-yd tilting mixer and one of the special dump body types. In this case truck charging time is greatly reduced.

As pointed out for transit-mix operations, production figures given in the table for the various size batchers, mixers and haulage units are an approximation, or an average of central-mix operations. It is to be expected that certain plants, possibly by reducing mixing time below that established by ASTM specifications, will achieve production figures in excess of those shown. It is likewise to be expected that other plants may not be able to achieve the production quantities shown.

Concrete Products Plants

The most important factors which dictate arrangement of a concrete products plant are capacity and products to be produced.

Much of the information given on ready-mixed plants will apply to the concrete products plant. But

(Continued on page 142)

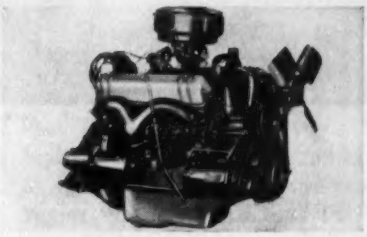
HERE'S HOW YOU SAVE WITH FORD *TRIPLE* ECONOMY

You get more truck for your money in a FORD

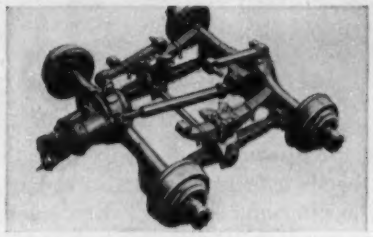
From front to rear axle, new Ford *Triple Economy* saves you money all the way

In every Ford Truck you'll find a new gas-saving, LOW-FRICTION engine. For greater driving ease, there's Ford's famous *Driverized* Cab. And every Ford has strong, low-weight chassis for money-saving load capacity. For complete information, see your Ford Dealer *today!* Or write: Ford Division, Ford Motor Co., Dept. T-9, Box 658, Dearborn, Michigan.

Brand new Ford factory-built T-800 Tandem-Axle BIG JOB is rated for 40,000 lbs. GVW, 60,000 lbs. GCW—gives you up to 3800 lbs. more payload than other make 6-wheelers in this class. Powered by the new 170-h.p. *Cargo King* V-8.



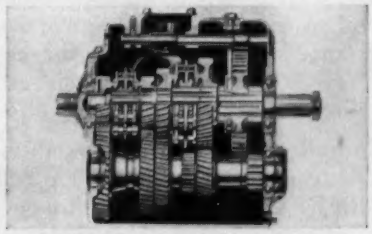
New Low-Friction 170-h.p. *Cargo King* V-8 gives you up to 41% more power per cubic inch than other truck engines in its class.



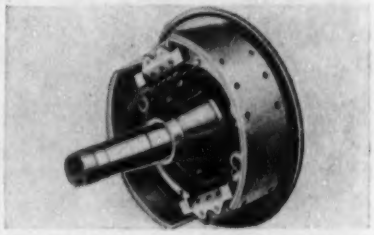
Latest design tandem axle bogie features rubber-bushed suspension and power divider with 3rd differential lockout.

New Master-Guide Power Steering is standard on T-800. Operative at all times, it cuts steering effort as much as 75%.

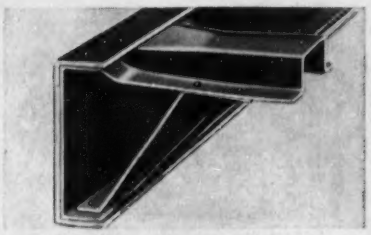
***Driverized* Cab** has big, one-piece windshield, free-breathing woven plastic upholstery, exclusive seat shock snubbers.



Heavy duty, 5-speed Synchro-Silent transmission is available in direct or overdrive. Auxiliary transmissions also available.



New T-Series has vacuum-power operated hydraulic brakes on all six wheels. Full air brakes available on the T-800.



Deep, double channel frame has parallel side rails 9¼ in. deep. Reinforced from rear of front spring to end of frame.

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Would You Like To INCREASE Scraper Rope Service?

Others Have!... by switching to: Tuffy SCRAPER ROPE

Wheel Scrapers Need a wire rope that is flexible enough to withstand sharp bends over small drums and hug sheave grooves . . . stiff enough to resist looping and kinking when slack, TUFFY SCRAPER users report greatly increased service after switching to Tuffy.

Tuffy Is Specially Constructed for the purpose of absorbing the many and varied stresses imposed by wheeled scrapers! Strands are pre-shaped to give *Longer Life*—the strength of every strand is concentrated on carrying the rope load, thus a balanced construction. This special design allows TUFFY SCRAPER ROPE to resist drum crushing abuse and the strains caused by angle pulls through swivel-mounted sheaves.

No Complicated Specifications are needed when you order. Just state the length, diameter and "TUFFY SCRAPER ROPE". See for yourself how TUFFY SCRAPER ROPE can pay off for *you!*

Tuffy Slings

9-part machine-braided wire fabric. Will not materially damage fabric when kinked or knotted! Favorite with those that demand safety and lower costs!

Tuffy Hoist Line

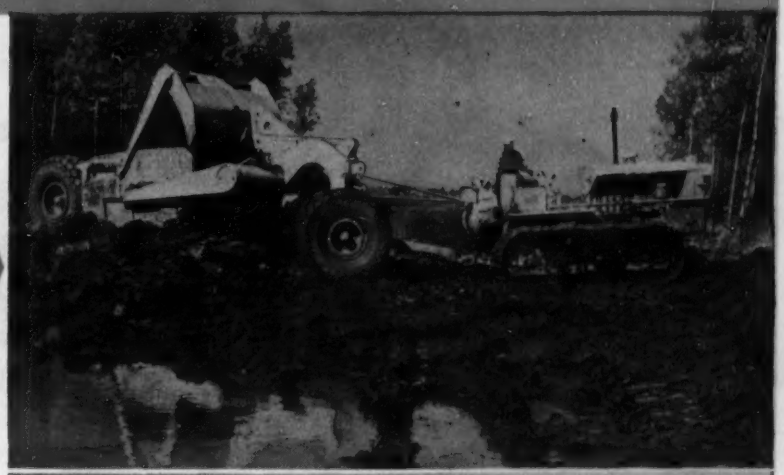
Designed to give you the utmost in service, Tuffy Hoist Line is tailor-made for use on OVERHEAD, STIFF LEG and MOBILE CRANES, CLAMSHELLS and DERRICKS.

Tuffy Dragline

Designed to give maximum abrasive resistance and flexibility! Rides better on grooves, hugs drum when casting!

Scraper work, such as building this farm-to-market road, puts much strain on rope . . . causes stresses that ordinary wire rope just can't take for long. TUFFY SCRAPER ROPE is specially pre-shaped to apply the *full strength of every strand* to the rope load!

Highway construction jobs often run into tough spots like this water-filled pot hole. Moving the heavy, gummy clay to fill it for a good road bed imposes a terrific strain on scraper rope. On jobs like this the flexibility and super strength of TUFFY SCRAPER ROPE really pays off.



The power of a crawler in front and back of a scraper is needed in some cases to hack out the dirt when preparing runways for jet planes. TUFFY SCRAPER ROPE plays a most important part. Its long life does away with expensive downtime caused by rope failure. The construction of TUFFY SCRAPER ROPE is so designed to give you long and economical service!

Tuffy Dozer Rope

Combined with proper cut-off procedure, TUFFY DOZER will greatly increase your service life . . . cuts downtime. Available in 150' lengths ½" and 9/16" diameter.

union Wire Rope corporation

2270 Manchester Ave. Kansas City 26, Mo.

Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric

there are some great differences. Mixers used in concrete products plants are entirely different, being of the paddle type. The mix is very dry, relatively speaking. It is essential to control accurately the moisture content and aggregates often are lightweight aggregates.

Tonnage figures given with ready-mixed bins will not apply to concrete products plants. It is necessary to apply a conversion factor or to use the yardage figures in *Table 1*.

Because of the height of block machines or pipe machines generally used, it is necessary to locate the mixers approximately 6 to 7 ft. higher above ground than would be the case in a central-mix plant.

Ample space must be provided around each concrete products machine for maneuvering, to allow delivery of the pallets and to permit removal of products. This requirement often will dictate the use of a trolley batcher in which materials can be weighed and then transported in the weigh hopper to the mixer. Any other arrangement is apt to require the extensive use of chutes or inefficient crowding of mixers and concrete product machines. The extensive use of chutes is never recommended.

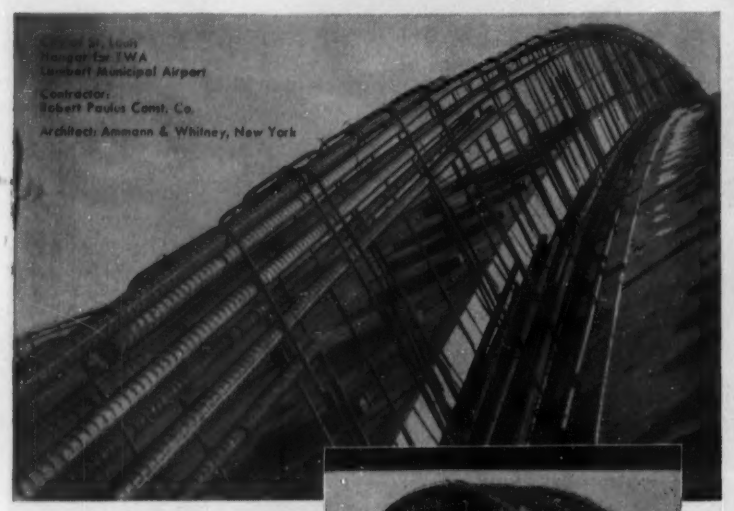
Appearance of the plant and facilities is of increasing importance. Building contractors in a community once were the only customers of the ready-mixed and concrete products plants. They were concerned with price, delivery and quality.

During recent years there has been a phenomenal increase in the work done about the home by the home owner himself. The home owner is less concerned with a few cents differential in the price of concrete. He is more apt to buy concrete and blocks from the company whose office, yard and plant present a well ordered and pleasing appearance. The bin should be roofed. Without a roof, there will be little uniformity of moisture content of materials, and rainwater will drip from the bin bottom making it difficult to keep the batcher and other equipment clean and free of rust.

The batcher and mixer floors must be enclosed. Operating personnel and equipment must be protected against the weather. Working areas must be heated in cold weather. Stairs must be provided to mixer and batcher floors.

★ ★ ★

THE NEXT ARTICLE of this series will appear in the August issue.



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Caterpillar Provides Customer Credit

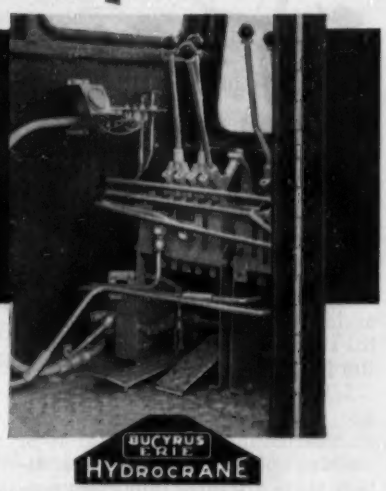
TO ASSIST its domestic and Canadian dealers in financing time payment sales, the Caterpillar Tractor Co., Peoria, Ill. has formed the Caterpillar Credit Corporation, a wholly owned subsidiary, in which it will invest capital as funds are required. This investment will be supplemented later by bank borrowings by the subsidiary.

The new credit corporation according to A. T. Brown, executive vice-president, is not intended to compete with banks or finance companies, but rather to provide dealers with an additional source of credit when other sources have been exhausted.

Headquarters of the corporation will be in Peoria, site of Caterpillar's major manufacturing plant. Incorporation papers have been filed in Delaware.

The board of directors consists of Louis B. Neumiller, Harmon S. Eberhard, and A. T. Brown, all of Peoria and Harry Fair and R. W. Miller, both of San Francisco.

BUCYRUS-ERIE presents NEW UP-RATED SELF-POWERED HYDROCRANE with selector valve



Now Bucyrus-Erie offers a new, more powerful all-hydraulic crane-excavator — the self-powered H-3 Hydrocrane. Taking its power from its own 4-cylinder industrial engine instead of from the truck engine, the new self-powered Hydrocrane provides the following big advantages:

1. **Increased horsepower** through eliminating restrictive influence of side-mounted truck power take-off.
2. **Selector valve operation.** Power concentration selector unit permits channeling hydraulic fluid from all three pumps to one valve bank — increases line speeds up to 50%.
3. **Convenient operation.** Selector valve is foot operated — provides metered control of higher speeds—operator need not let go of hoist and swing levers to operate selector valve. Controls for power plant conveniently grouped at operator's station.
4. **Reduced crane maintenance** from simpler more direct power application. High pressure hoses through center pin leading from pumps to valve bank eliminated. Fewer belts, shafts, and hoses.
5. **Improved efficiency.** Improved oil filtering with less restriction. Better cold weather performance.
6. **Improved truck engine life.** Economy results from fewer truck repair bills. Generator for independent power plant re-charges motor truck battery. Overall fuel consumption is less.

1H54

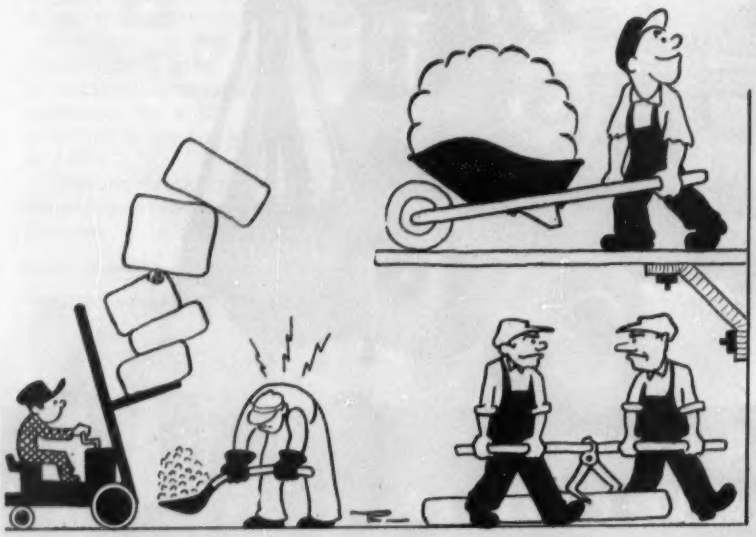
These are just a few of the advantages of the new self-powered Hydrocrane — and self-power is just one of the big features that is making the Hydrocrane foremost in 1954. See your distributor for complete details.

Bucyrus-Erie Company
South Milwaukee
Wisconsin, U.S.A.

Attack Accidents at Their Source

By JOHN D. GALLAGHER

Assistant Superintendent, Engineering Department, Chicago Office, Hartford Accident and Indemnity Company



25% OF ALL WORK INJURIES are incurred in the handling of materials which becomes an important labor cost factor on the job.

WHY SHOULD a contractor make the effort to keep injuries and job accidents at a minimum? What is his stake in accident prevention on the job?

Like other employers, the average contractor has a normal humanitarian interest in the safety of his men and of the public. In addition, there are three important economic advantages in establishing and maintaining an active, continuing program for safeguarding his men and the public against accidents:

(1) Holding his cost of workmen's compensation and public liability insurance at a minimum by keeping accidents at a minimum.

(2) Reducing the important hidden overhead costs that result from accidents.

(3) Eliminating obstacles to profitable job progress that arise out of the same conditions that cause work injuries.

Insurance Costs

Approximately 230,000 men are injured seriously on construction jobs each year in the U.S. And about 2,500 of the injuries result in fatalities. These figures include all trades and indicate the impact of accidents in construction. Specialists in the field estimate that half of the accidents can be prevented by practical methods and measures.

The average contractor can expect his insurance premiums to be generally higher if he has a consistently poor accident experience, and to be lower if he has a consistently good accident experience. For example, a contractor of moderate size or larger usually is subject to what is called "experience rating."

To demonstrate, let's assume there are two contractors, both doing the same kind of construction; that one of these has a poor claims experience because he hasn't paid much attention to safety in his job operations; and the other has a consistently good accident experience because he consistenly applies good safety standards on the job.

If the first contractor is paying a 50% "debit rate" because of his poor experience, and if the Manual or standard compensation premium rate is $7 per $100 of payroll, he would be paying 50% above the standard rate, or $10.50 per $100 payroll. Therefore, he would have to figure 10½% of his payroll in his job costs for insurance.

If the second contractor, because of good experience, is paying a "credit rate" of 50%—half of the standard rate—he would be paying only $3.50 per $100 of payroll, and would have to figure but 3½% of payroll in his job cost for insurance. The rate paid by this contractor is 1/3 of that paid by the first man. This would be a tremendous advantage in bidding on a job.

For example, assume that both contractors have a $30,000 payroll and submit bids on a $100,000 project. The second contractor, who has the better loss experience, would include in his total bid $1,050 for insurance costs, while the first contractor would have to allow $3,150. That's a difference of $2,100, or 2.1% of the total contract.

Although the insurance rate on other classes of work is considerably lower than $7 per $100 of payroll, the foregoing example illustrates how the opportunity for lowering the cost of insurance can be an important incentive for the contractor to follow good safety standards on the job.

Hidden Costs

There are many types of non-insurable costs in the contractor's overhead, over and above the cost of insurance, that are due to accidents. These hidden costs average between four and five times the cost of the compensation and medical payments. Hidden losses arising from accidents include:

HIGHER INSURANCE COSTS will cut down profits of contractor with poor accident experience.

(1) Interruptions in work progress.

(2) Damaged equipment and tools.

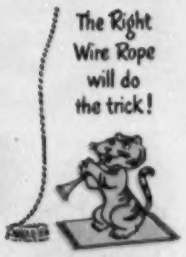
(3) Spoiled work.

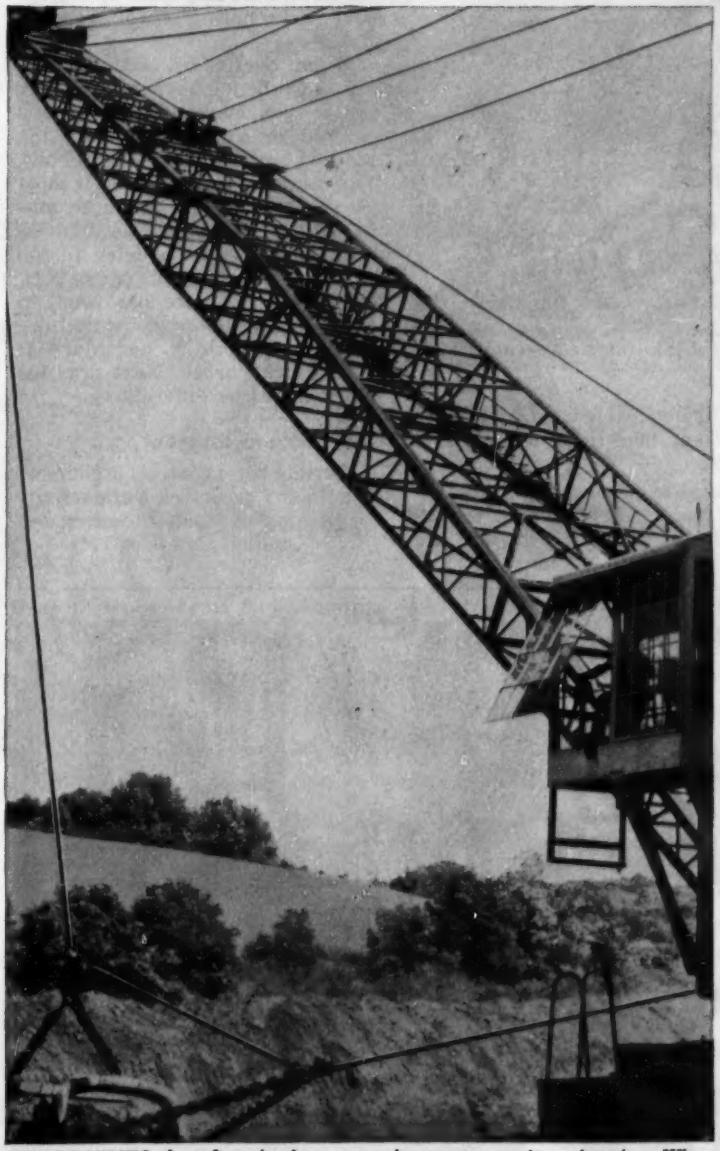
(4) Time lost by foreman in helping a man injured in an accident; in arranging for his production to be continued by someone else; in hiring and breaking in a new man to replace the injured man.

(5) Time lost by other men who

(Continued on page 146)

TROUBLE-FREE SERVICE around the clock from Tiger Brand Drag Rope





ASSURE YOURSELF of good service from your wire ropes—consult an American Wire Rope Engineer regularly.

ONE of the largest coal companies in Pennsylvania gets excellent service from Tiger Brand Wire Rope. On this big dragline, for example, 2¼" Tiger Brand Drag Rope lasts for 8 to 12 weeks, and 1⅜" Tiger Brand Hoist Rope lasts 4 to 6 months. This is good service, because these ropes work 24 hours a day, 6 days a week, every week of the year.

As a result of consistently good service records like these, many such operators use Tiger Brand Wire Rope exclusively on all their excavating machinery.

Like hundreds of other companies that do a lot of excavating, you will find that once you start using Tiger Brand Wire Rope, you keep down rope costs, keep down rope trouble, and *keep on using* Tiger Brand.

For a list of Tiger Brand Wire Ropes and the jobs each one can do best, send the coupon.

FREE ROPE BOOKLET

American Steel & Wire
Dept. B-64, Rockefeller Building
Cleveland 13, Ohio

Please send me, without obligation, a copy of your helpful wire rope selection guide, "The Right Rope for the Job."

Name.....

Company.....

Address.....

City & State.....

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL

EXPERT HELP AND GUIDANCE are available to contractors who are interested in solving their safety problems. Consult the engineering department of your insurance company.

stop work out of sympathy, or to assist the injured man.

(6) Loss of production owing to the use of a replacement man who is not as skilled or reliable as the man who was injured. This loss is especially noticeable when an experienced key man in an organization is hurt.

(7) Loss of production by the injured man if he continues on the job while still handicapped and must therefore perform at below-par efficiency until his injury is completely healed.

Obstacles to Job Progress

An accident may not only interrupt or interfere with the orderly progress of the job, but also result in damage to equipment, spoiled work, injuries and other conditions that hinder normal, efficient operations.

If an overloaded scaffold collapses on the job, there may or may not be someone underneath who is injured or killed. However, the scaffold usually has to be rebuilt, the materials that were on it must be rehandled, some of those materials may be damaged beyond use and there may be a delay in job progress. Even though there may be no injury, there has been an accident and some production delay. That there is no injury is just a lucky break. Next time the story might be different.

Controls are Essential

Certain basic controls are important in any organized work activity in holding production delays, ex-

(Continued on page 148)

WILL YOUR NEXT BID INCLUDE
THE "FINAL FACTOR"?
Many times a low bond rate can be the *final factor* that tilts a bid in your direction.
How can you make sure of this *final factor* in your bids? Ask your Indemnity Agent to establish your credit line with Indemnity Insurance Company of North America. This large independent company offers the lowest bond rates* to contractors of *skill, integrity* and *responsibility*.
You save money on these low rates. An established credit line assures you of getting bonds on future jobs without delay. See your Indemnity Agent now.
*Sorry, Indemnity's low rates are not available in Louisiana and Texas.
Protect What You Have©
Philadelphia 1, Pa.
INDEMNITY INSURANCE COMPANY OF
NORTH AMERICA
One of the North America Companies which are headed by Insurance Company of North America, founded 1792

"We want a versatile 15-yard rig"—

said these contractors—and thanks to them,

The new Terra Cobra TH-090B has a heaped capacity of 15.0 cu. yds., 12.2 struck. It's powered by a 180 hp Cummins Diesel, with a 4-speed syncro-mesh transmission, and incorporates basic features of the larger models.

here's the new TERRA COBRA TH-090B

"Keep the ruggedness and simplicity of your bigger units," they told us, "and give us a middle-range rig that's big enough to pack good pay loads. Trim it down just enough so we can use it to advantage on both large and small jobs." After checking with successful earth-movers from one-man independents to top contractors coast to coast—Wooldridge engineers found the most-wanted combination was a 15-yard rig with 180 hp—so that's what you'll find in the Terra Cobra TH-090B. It duplicates major advantages of the big 10-speed TH-0142—latest open bowl, high ground clearance, low center of gravity, short turning radius, fast loading and dumping—with unequalled ruggedness, simplicity, accessibility, and low down-time requirements. If you'll check with your Wooldridge dealer, you'll find why the new TH-090B will put more yards in place per dollar invested, year in and year out.

♦Where maximum range of speed, power and capacity are required, the big 225 hp 10-speed Terra Cobra TH-0142 is daily setting new records for yards in place.

WOOLDRIDGE

WOOLDRIDGE MANUFACTURING COMPANY

SUNNYVALE, CALIFORNIA

TERRA COBRAS

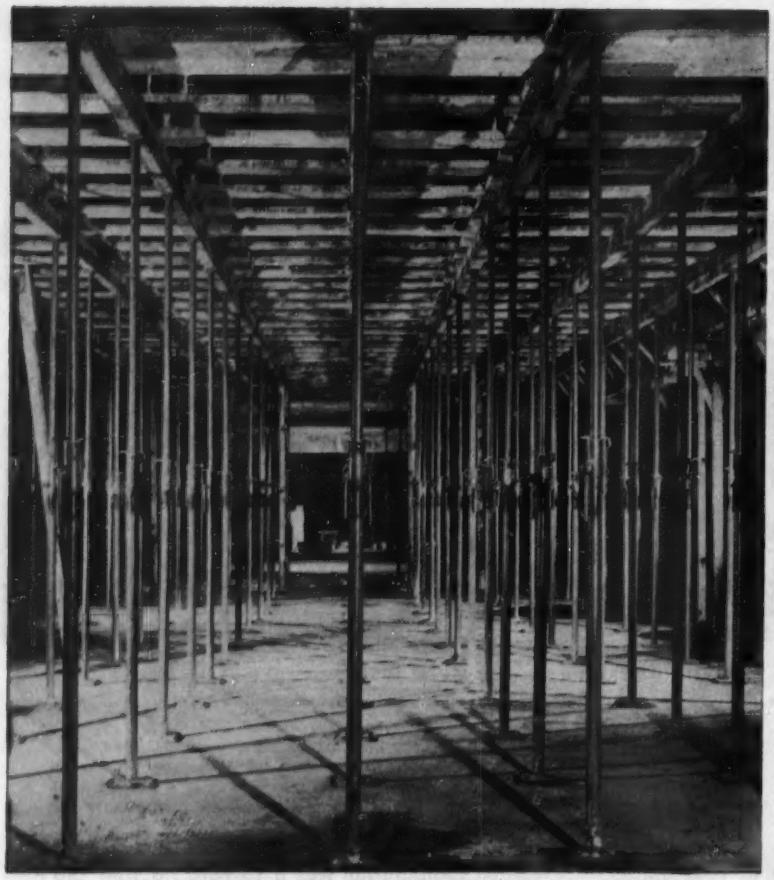
TERRA COBRA WAGONS

SCRAPERS

CABLE CONTROL UNITS

RIPPERS

BULLDOZERS



These 13-foot Safway Shores support two 4" x 4" ledgers. Notice that they require no cross bracing even at 12½-foot extension.

Parker Pen Builds a Noise-free Plant

Hundreds of Safway Steel Shores Speed Construction on Ultra-modern Factory

THE GEOMETRIC FOREST of Safway Steel Shores you see here supports the concrete formwork during early stages of construction on a new kind of factory.

It's the 200,000 square foot Parker Pen plant in Arrow Park at Janesville, Wis. Designed to eliminate production noises, the plant is a model for industrial plants of tomorrow.

ONLY 3 SHORE SIZES NEEDED

No less modern in design and operation are micro-adjustable Safway Steel Shores designed to cut labor time and costs on all kinds of reinforced work. Each size Safway Shore is adjustable through a 5-foot range so that only three sizes are needed to cover the full range from six to 15½ feet. Select from three heads for a wide variety of applications.

You can rent or buy Safway Shores from any one of the Safway Shore dealers near you. To get more information on cutting costs with Safway Shoring, write for your free bulletin. Submit construction problems for analysis.

SAFWAY STEEL PRODUCTS INCORPORATED
6247 West State St.
MILWAUKEE 13, WIS.
Manufacturers of Tubular Steel Scaffolding and Equipment

RENTED and SOLD by distributors everywhere

ATTACK ACCIDENTS . . .

Continued from page 146

cessive man-hours of work, injuries, damaged equipment and spoiled work to a minimum. We know from experience that these controls are not always employed properly, and that resulting injuries and work hindrances are reflected in both increased insurance costs and increased job costs. Injuries that increase insurance costs arise out of the same conditions that increase job costs.

Two slogans with particular application to our subject are: "Plan your work, and work your plan," and "A job well done is inherently safe." The latter simply means that if a job is well done, safety is given careful attention in both the planning and execution of the job. Our experience in insurance safety work shows that if thorough consideration is not given in planning to such factors as (1) the arrangement and use of equipment, (2) erection procedures, (3) handling and storage of materials, and (4) cooperation with other trades, then injuries and other hindrances to profitable job progress will result.

• **With respect to equipment,** these control factors are:

(1) Selection of adequate and safe equipment to get the job done efficiently.

(2) Arrangement of equipment to minimize unnecessary handling of materials and to insure the smooth flow of materials to points of installation.

(3) Proper and safe use of equipment for the purpose it is intended to serve.

(4) Maintenance of equipment in safe and good operating condition at all times.

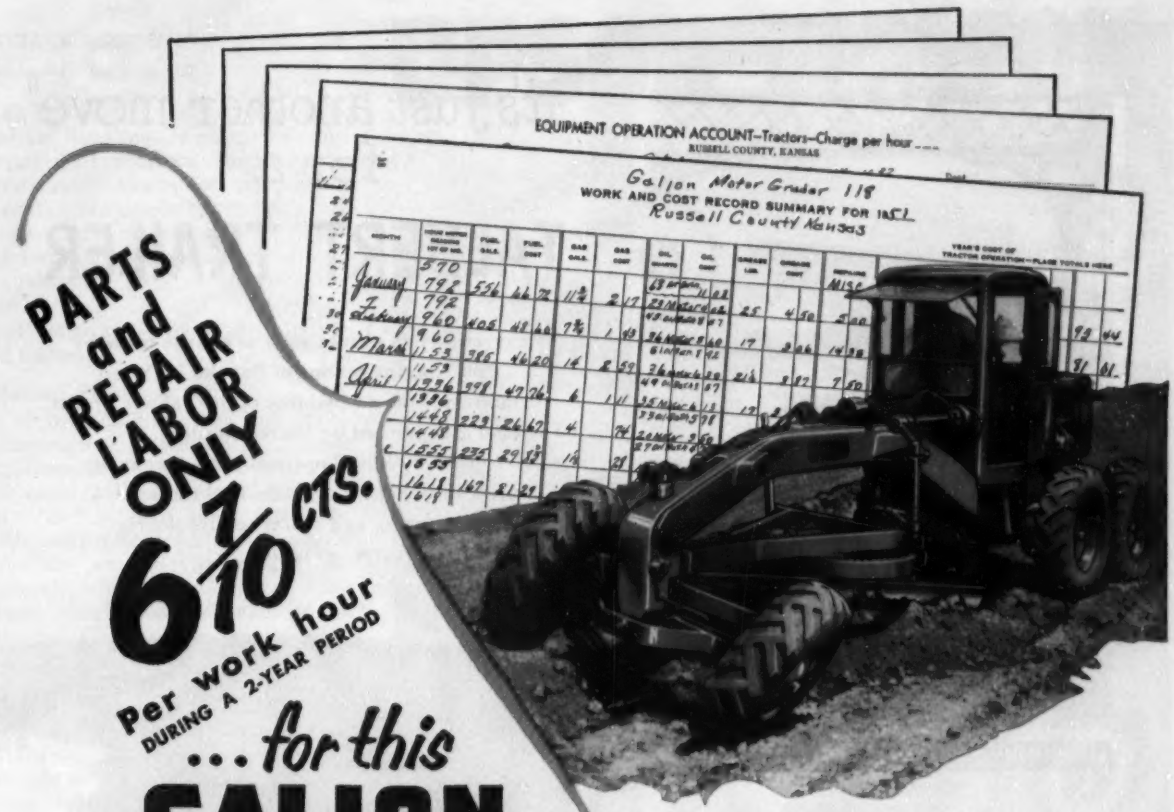
• **With respect to materials,** these control factors are:

(1) Selection, ordering, and scheduling of materials deliveries, so that the right materials are on hand, in the quantities required, and at the proper time and place for installation.

(2) Locating of materials in the best areas for unloading upon delivering.

(3) Proper storage of materials (a) to facilitate efficient usage, (b) to maintain them in good condition, and (c) to avoid unnecessary excess handling and to insure their smooth and efficient handling to points of installation.

(Continued on page 151)


EQUIPMENT OPERATION ACCOUNT—Tractors—Charge per hour ---
RUSSELL COUNTY, KANSAS
Galion Motor Grader 118
WORK AND COST RECORD SUMMARY FOR 1951
Russell County Kansas

PARTS and REPAIR LABOR ONLY 6 1/10 CTS.

Per work hour DURING A 2-YEAR PERIOD

...for this GALION MOTOR GRADER

Maintenance costs are watched carefully in the Russell County Highway Department in Kansas. Quality of equipment design and construction are quickly reflected on the detailed "Work and Cost Record" sheets kept by this county.

They reveal that for 1951 and 1952 the total repair costs *(parts and labor)* for their GALION 118 Grader amounted to only $245.79. Prorated over the 2-year total of 3,679 recorded work hours for this grader, gives the amazingly low repair cost figure of 6-7/10 cents per hour. That's the kind of service record that SAVES MONEY!

Write for literature.

Ask your Galion Dealer to show you the color movie "GALION MAKES THE GRADE"

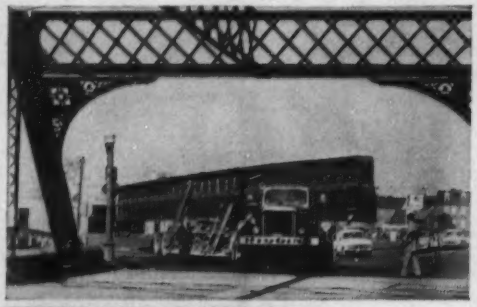
IF YOU WANT TO CUT COSTS ...BUY A GALION MOTOR GRADER

ESTABLISHED GALION 1907

MOTOR GRADERS · ROLLERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio



MINIMUM CLEARANCE

MAXIMUM TURNING RADIUS

"it's just another move" for a TALBERT TRAILER

We're using this picture story of a move made by Wm. Higgins & Sons of Buffalo, N. Y., to demonstrate the adaptability of the Talbert Trailer. The load is supported on the rear trailer and the back bridge (removable rear axles) of the lead trailer . . . with the lead trailer acting as a spacer to give the rig extreme turning radius.

Talbert Model TD-35-RG-RA
35 ton capacity
removable gooseneck
removable rear axles

Talbert Model TD-70-RG-RA
70 ton capacity
removable gooseneck
removable rear axles

These features are available for Talbert Trailers in every capacity

Removable Gooseneck	Raised Center Deck
Fixed Rear Axles	Drop Side Deck
Removable Rear Axles	Beam Deck
Removable Third Axles	Single Axle Dolly
Standard Deck (flat)	Jeep Dolly

Extendable pole trailer reach

For additional details request Catalog No. 104

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

ATTACK ACCIDENTS . . .

Continued from page 148

(4) Use of the most efficient materials-handling methods and equipment possible (including a systematic means of scrap disposal). Materials-handling is always an important labor cost factor, and is the source of approximately 25% of all work injuries.

(5) Safe and proper installation of materials.

Human Relations Vital

If the foreman does not apply constructive principles of human relations in supervising his men, he often will not have a cooperative and efficient work force. In this regard he needs to remember that the workmen are people like himself, who wish to be treated the same way he would want to be treated if he were on the other side of the fence.

Accident prevention in construction is largely a matter of education, vigilance and cooperation. Hard-and-fast rules alone will not insure safety on the job. This can only be gained by constant and careful attention on the part of the foremen, with the cooperation of the men. And the men should be taught to think in terms of safety and not to take unnecessary chances.

In general, if the basic causes of injuries are eliminated, then both the injuries and such hindrances as excessive man-hours of work, job delays and spoiled work, will be either prevented or minimized. The answer lies in the proper application of skills in planning, instructing, and supervising, to certain basic control factors that are related to the equipment, materials, and people required for the job.

Personal Factor

The inherent hazards of construction work are intensified by the temporary duration of jobs and the shifting of men from one type of job to another. Some of the important causes of construction accidents are:

(a) Inexperience of workers on a specific type of job.

(b) Improper care of equipment and tools.

(c) Lack of knowledge on the part of the workers in proper use of equipment and materials.

(d) Chance-taking and lack of attention to safety precautions.

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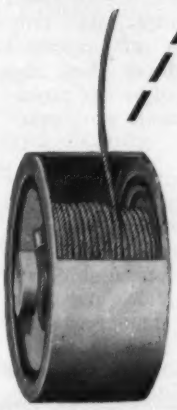
UPSON-WALTON



Here's wire rope for rugged service

TOUGH construction jobs call for tough wire rope—specify Upson-Walton! Upson-Walton craftsmanship and high quality standards build long service into Upson-Walton wire rope.

Available in all standard sizes and constructions. For prompt service call your Upson-Walton Distributor. Free booklet on request.

THE UPSON-WALTON COMPANY

12500 ELMWOOD AVENUE • • CLEVELAND 11, OHIO

NEW YORK • CHICAGO • PITTSBURGH

MANUFACTURERS OF WIRE ROPE, FITTINGS, TACKLE BLOCKS—ESTABLISHED 1871

The most productive BLAST HOLE DRILLER

McCarthy Drills

Heavy-Rugged Powerful

● Time and again McCarthy Drills get the nod from operating men . . . men who've made actual tests proving that no other equipment can match a McCarthy for speed, stamina and versatility.

At the Bessemer Limestone and Cement Company, Bessemer, Pa., one McCarthy unit averages 90 ft. per hr., working through a facing of blue shale 34 ft. deep. Holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. Another McCarthy unit has been installed in a different section of this quarry and it, too, is breaking all previous records for fast, low cost shot hole drilling. McCarthy Drills operate with all types of power units on all types of mounts. Write today for full facts about this finger-tip controlled money saver.

SALEM

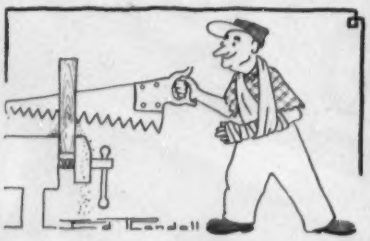
THE SALEM TOOL CO.
765 S. ELLSWORTH AVE.
SALEM, OHIO · U. S. A.

ATTACK ACCIDENTS . . . Continued

To attack these causes, the following control factors are vital:

(1) Proper selection of men for the job to be done with regard to skill, experience, and physical capabilities.

(2) Assignment of men to specific work tasks to which they are fitted by their skill, experience and physical condition. For instance, some individuals are better able than others to work in high and exposed places.



LOSS OF PRODUCTION results from below par efficiency of worker who continues on job while still handicapped.

(3) Adequate instruction of employees in proper and safe job methods in order to avoid mistakes resulting from lack of knowledge and misunderstandings.

(4) Proper supervision to avoid the possibility, due to continually changing conditions on the job, of some mistake or hazard entering the work picture and causing an injury or other hindrance to profitable job progress before the foreman is aware of its existence. Good supervision includes not only prompt correction of improper production procedures, but also prompt correction of unsafe physical conditions or unsafe work practices.

Weakness in applying the skills of planning, instructing, and supervising to the foregoing control factors results in injuries and also in hindrances to profitable job progress. Both injuries and these other difficulties stem from the same cause. This is a definite economic incentive, which experience in the field of accident prevention has proved to have real value to management.

No Substitute for Common Sense

The biggest part of accident prevention is just plain common sense. Supervisors trained in construction

(Continued on page 154)

HOW TO HANDLE WET JOBS

#28 of a Series

WATERWORKS SIPHON

Kent, Ohio

Contractor: Engstrom & Wynn

PART-TIME PUMPING DRIES JOB QUICKLY, CUTS COST

How IMPORTANT is the engineering factor in wellpoint work? This job is a good case in point.

● Soil was coarse sand, overlying an undulating clay base, top of clay being close to subgrade. Confronted with these conditions, contractor quite naturally figured pre-drainage on a basis of continuous pumping 24-hours-per-day.

● Griffin engineers, however, devised a unique layout, using special-screen points and special placement. With this layout, plus careful supervision, the job was speedily dried with only 9 hrs pumping per day (thus bringing operating and fuel costs far below estimate). Yet results were so thorough that drainage influence extended to dewater all footing excavations in the surrounding area.

GRIFFIN

WELLPOINT CORP.

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Toronto Montreal Halifax

LAND CLEARING IS PROFITABLE

... with Specialized Fleco Tools!

You may be passing up many profitable jobs if you're ignoring farm land clearing work. Millions of acres must be cleared and, with Fleco land clearing tools, the cost per acre is at a money-making low.

Fleco products are designed and built specifically for land clearing. Production is high, cost is low and rugged durability enables you to write-off your investment over many jobs. You can assign many construction tasks to versatile Fleco tools.

Shown here are several Fleco land clearing tools. Your Fleco-Caterpillar Dealer can supply additional facts on this equipment and can tell you about the other tools available. Plan on pushing *your* profits with land clearing jobs and Fleco equipment!

THE FLECO ROCK RAKE...

tough, heat-treated, alloy steel teeth comb beneath the ground surface to rake out rocks, roots and to stack debris. Dirt remains on the ground to make easy-burning piles. All the tractor's power is utilized to remove undesirable growth or rocks instead of soil. Except for large boulders and other extra-heavy work, a lighter-duty Fleco Root Rake does the same jobs. A size for every tractor.

THE FLECO TREE-CUTTER...

slices off trees up to 16" diameter at the ground levels. Tension bar puts trunk fibers under stress and sharp steel blade shears the tree with a smooth cut. A 10' swath of 10"–12" trees can be cut in third gear. Available for all track-type tractors.

THE FLECO DETACHABLE STUMPER...

concentrates power on one small area. The strong steel casting attaches to dozer C-frames. Four hard-faced teeth bite into the root system of tree or stump and hold on while cable or hydraulic lifting power is applied to rip the growth from the ground.

FLECO CORPORATION, JACKSONVILLE, FLORIDA

FLECO®

ROOT RAKES • ROCK RAKES • DETACHABLE STUMPERS • TREEDOZERS • PULL STUMPERS • BRUSH RAKES • V-PLANES • UNDERCUTTERS • ROOT CUTTERS • TREE CUTTERS • CAB GUARDS • ATTACHMENTS

SEND FOR THIS FREE BOOK...
showing Fleco Job-Matched Tractor Tools for low-cost land clearing, rock-removal, brush control, and construction clearing. It's free and loaded with profitable facts!

YOUR FLECO DEALER IS YOUR CATERPILLAR® DEALER

10:00 P.M. 8:00 A.M.

Scrap value: $65

...but our Hartford Contractors' Equipment policy paid us $12,250!

(Based on Company File #63028)

Our men had been working at the saw mill. When quitting time came, they put our tractor and the straddle carrier in the mill's planing shed.

During the night, the shed caught fire. Our two pieces of equipment—worth over $12,000—were a total loss. What was left brought $65 as scrap.

I'm mighty glad we were prepared for something like that. Under our Contractors' Equipment policy, the Hartford Fire Insurance Company paid us $12,256.70.

Are you "prepared for something like that," too?

It doesn't have to be *fire*. Wherever your equipment is, lots of hazards lie in wait for it. Theft, for example. Or damage by explosion, collision, overturn, landslide, windstorm or riot.

That's why we suggest the *broad protection* of a Hartford Contractors' Equipment policy.

Have your Hartford Fire Insurance Company Agent or your insurance broker give you the complete facts about this insurance, outline a sound program of protection for *your* equipment—now.

Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company • Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company • *Hartford 15, Connecticut*

How much is your equipment worth?

The Hartford Fire Insurance Company has prepared a free booklet, *Your Machinery and its Actual Cash Value*. Send for a copy. It may help you avoid a big loss.

CM-6-54

HARTFORD Fire Insurance Company
Hartford 15, Conn.

Please send me a free copy of *Your Machinery and its Actual Cash Value*.

Name_____

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Street_____

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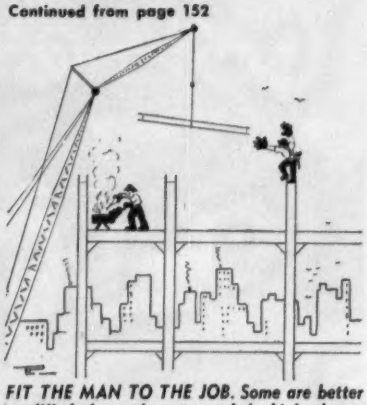
ATTACK ACCIDENTS . . .

Continued from page 152



FIT THE MAN TO THE JOB. Some are better qualified than others to work in high places.

are familiar with the best methods of doing various jobs, but in their hurry to get on with the work they sometimes allow the use of short-cut methods that increase the chances of injuries and other troubles.

The workman's attitude toward safety depends entirely on the attitude of the foreman. If the foreman is indifferent, the men will be indifferent, but if he believes in safety—if by his actions and words he convinces his men that he is determined to have safe work practices followed and to have a good safety record on the job—then his men will usually respond accordingly.

The average foreman needs to be reminded periodically about things he already knows about safety and to have emphasized to him the importance of job methods which are best, not only from a production standpoint, but also from the standpoint of safety.

It is up to the supervisory force to see:

(1) That unsafe physical conditions are eliminated.

(2) That good job housekeeping is maintained and congestion avoided.

(3) That when working around steel mills and in other industrial installations, adequate attention is given to special environmental hazards and local safety rules.

(4) That safety and protective equipment, such as goggles, hard hats, safety shoes are worn.

(5) That on power-line construction where there is exposure to high voltage equipment, rubber gloves, line hose, rubber blankets, "hot sticks" etc., are used, in accordance with accepted procedures.

(6) That, on building construction, safe ladders and scaffolds are used, protection around floor openings is kept in place.

a *NEW WAY* to fasten metal to wood or concrete!

with

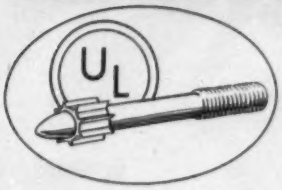
DRIVE-IT

Over 6000 Drive pins were used to install aluminum window frames to structural steel and concrete walls of the new Jefferson Hospital extension in Philadelphia, Pennsylvania.

Architect: Vincent Kling. *Contractor:* Wark & Co.
Drive-It Tools: F. H. Sparks and Co.

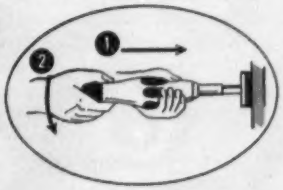
DRIVE-IT 320
WITH
BREAK-OPEN ACTION

Snap open action results in the fastest operating tool on the market. Easiest method to load and eject cartridges under any condition.



Drive pins are Underwriters' Laboratories approved.

Controlled Power. First and only tool which requires but one standard power load regardless of penetration desired. No need to buy and stock various strength power loads.



Three-way Safety. Cannot be discharged accidentally, due to the push and turn firing sequence. This, plus the large, swivel safety pad, makes DRIVE-IT triple safe.

More fastenings per hour with this speedy way of loading and ejecting cartridges.

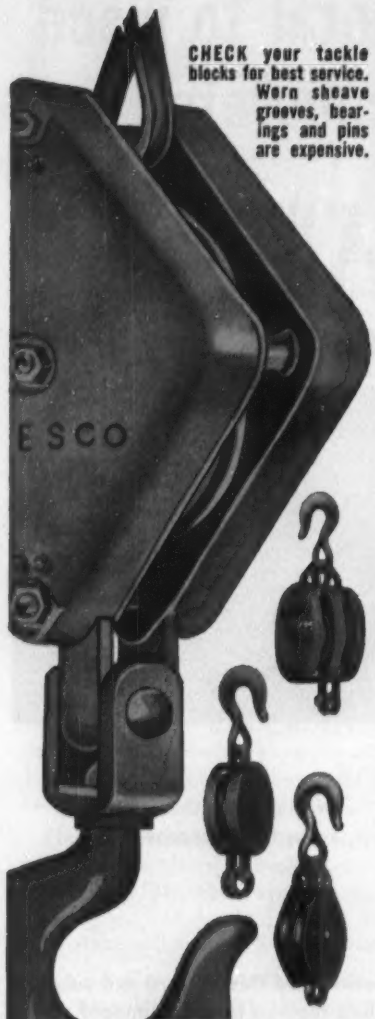
SEND THIS COUPON FOR FULL DETAILS

POWDER POWER TOOL CORP.
Dept. I, 7526 S.W. Macadam Ave., Portland 1, Ore.
Canada: Ammo Power Tool Co., Ltd.
735 Broadway, Vancouver, B. C.

☐ Please send FREE catalogue and literature.
☐ I want a FREE demonstration of *DRIVE-IT*.

Name_____
Street_____
City_____ State_____

DRIVE-IT
the original **POWDER-ACTUATED TOOL**



CHECK your tackle blocks for best service. Worn sheave grooves, bearings and pins are expensive.

LOWER HANDLING COSTS

are often attained by using "the one BEST block" for a specific load. MADESCO Blocks correctly designed and engineered for your specific operation may effect savings YOU can benefit from!

Twenty-five years' experience in designing and making blocks for "a-thousand-and-one" different uses means that MADESCO Blocks help speed hoisting, give trouble-free service, help prolong rope life.

Write—today—for bulletins and consult us about your specific needs.

MADESCO TACKLE BLOCK CO.
EASTON, PA.

MADESCO BLOCKS

MAE-M593-2-54

How Are Your Work Habits?

We all have habits and they play an important part in anything we do. What matters is whether our habits are good or bad ones. Here's a little "check-off" table on habits that might be reviewed in a foremen's safety meeting. Check your answers.

Subject	Good Habits	Bad Habits
Driving Motor Vehicles	Precision driving — doing the right thing every time. Good maintenance.	Giving signs, observing speed limits, etc., only when you think you have to. Maintenance neglect.
Housekeeping	A place for everything and everything in its place.	No time to do housekeeping.
Lifting	Know how to lift. Avoid overlifting.	Overlifting, lifting with one's back, by jerking, or while in an awkward position.
Use and care of small tools	Know the safe way to use each tool. Use the right tool for each job and keep them in good condition.	Do not know proper way to use tools — Wrong tool for the job — Tools in poor condition.
Loading or unloading equipment or handling materials.	Calls for good supervision, careful planning and good team work.	No supervision — No planning — Poor team work.
Working in rough terrain.	Plan your work. Take all necessary safety precautions.	No planning — No precautions
Poison weeds, snakes and insects.	Know conditions you are exposed to. Use all necessary protective and preventive measures. When required, get prompt first-aid and medical attention.	Very little or no thought given to the matter.
Worry	Take stock of your problems. Do what can be done to solve them. Put your mind at rest.	Continually turn your problems over in your mind, but take very little or no action.

Accidents Controlled by Good Safety Program

EBASCO SERVICES, INC., one of the largest consulting, engineering and construction organizations in the country, considers accident prevention an integral part of every job, is genuinely concerned for the safety and health of the individual worker. They recognize unsafe performance is inefficient performance and injury and damage expenses and the hidden costs of accidents seriously affect the economy of the construction operation.

The firm has a safety program which includes all activities on any project regardless of the size which is based on three elements: (1) Top management safety policy and active support, (2) A safety achievement award program, (3) Safety in action on the job.

The first of the basic elements is not an item for showcase. Top management means every word and stands solidly behind it.

The second element of the safety program is designed to give top level recognition to the project superintendent and employees on any construction project that achieves excellent accident prevention during an award year. Of the 46 projects Ebasco had working last year, 15 received achievement awards.

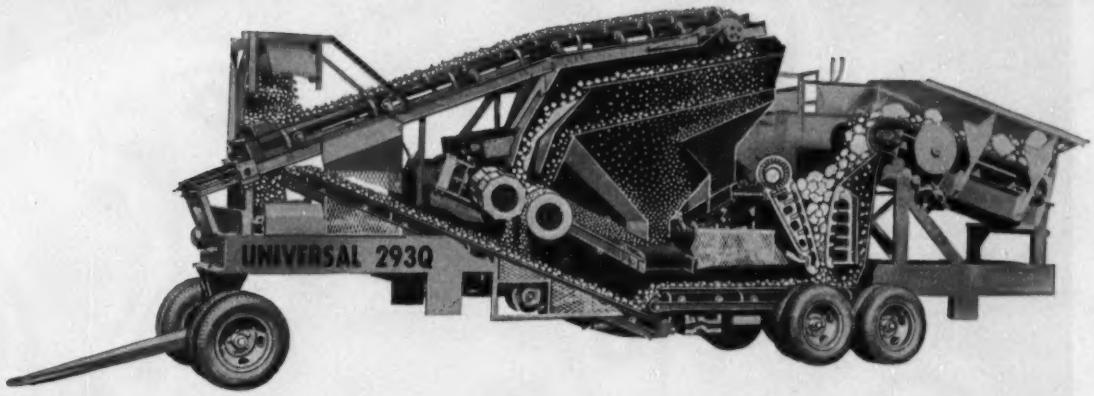
The final element, Safety In Action On The Job, starts with a safety clause in the contract. Contractors are given safety orientation by project superintendents when they begin work. The latter is safety director and has a safety committee of top supervisors who meet with him at least once a week. If the job is large enough, full time safety engineers are assigned to the project.

Ebasco uses a practical and reasonable approach to safety. It sells safety to the contractors and if that fails, help is obtained through contractor's top management.

Ebasco is proud of its Construction Safety program and believes because of it men are alive and well today who would not be well and alive if it weren't for the program.

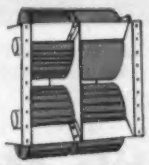
take 45 seconds to read this

and you'll know why Universal's 293Q is your industry's finest crushing plant



Universal 293Q TwinDual Pacemaker — two plants in one. Requires only one operator. For top capacity in rock and gravel. Completely portable.

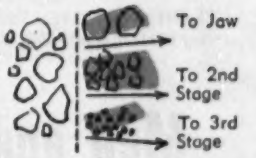
Universal gives you three full stages of crushing in a complete portable plant. There are actually 3 crushers in this exclusive 293Q Pacemaker. The jaw and two complete crushers in the TwinDual rolls (4 rolls — 2 sets mounted side by side on common shafts). Each is fed separately. No material enters any crusher unless crushing by that stage is required; in other words, a closed circuit after each crushing operation.



TwinDual Rolls

What this means! With 2 stages of reduction in the TwinDual roll crusher, the jaw is no longer a bottleneck . . . the discharge opening can be set up to 100% wider. Production is greatly increased — less jaw and roll wear — longer crusher life — less maintenance . . . because no crusher is burdened with over or undersize material.

9 big reasons why the 293Q is your industry's finest plant



1. TwinDual rolls permit up to 7 to 1 reduction ratio with 80% increase in capacity over a conventional roll crusher.
2. High roll reduction ratio doubles jaw capacity and gives better angle of nip.
3. Three separate stages of reduction in one portable plant; 1st stage — jaw crusher. 2nd stage — wide opening section of TwinDual roll crusher. 3rd stage — narrow opening section of TwinDual roll crusher.
4. High percentage of finish produced in each stage. 26% of material from jaw is finished and never enters another crushing stage. 53% of finish from second stage and 85% finish from third stage. Only 15% is again recirculated for crushing.
5. Here's the plant for rock or gravel. Large feed opening jaw handles large boulders in gravel pits.
6. Skid mounted jaw and feeder permits plant to meet highway weight limitations. Easy to move.
7. Only one plant to move. One power unit to service.
8. Feeder interchangeable with scalper screen for gravel operation.
9. Operators report up to 200 T.P.H. with 100% crush and 300 T.P.H. and over in gravel with 25% crush.

This is only part of the 293Q story. This plant is loaded with profit-making features to help you beat competition. Get the facts from your Universal distributor or write to Universal Engineering Corporation.

PETTIBONE UNIVERSAL
In Cedar Rapids, Iowa since 1906

UNIVERSAL ENGINEERING CORP.
327 8th St., N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Illinois

MUD ON THE MOVE. Sliding section of mountain extends 600 curving ft along and above the Northwestern Pacific railroad on the east side of the Eel River, threatening to push the tracks out of alignment and disrupt traffic.

Men and Machines Battle Moving Mountain

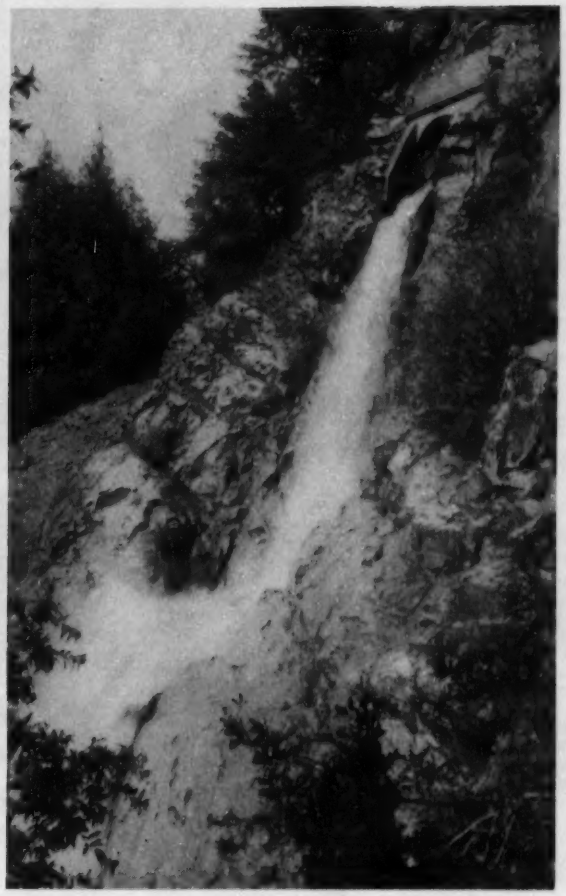
BULLDOZER-EQUIPPED track-type tractors shove muck down the mountain into the ditch along the inland side of the track where it is scooped up by shovels and deposited near the river within reach of the bulldozers.

A SLIDING MOUNTAINSIDE, set in motion by heavy rains in Eel River Canyon near Eureka, Calif., threatened to put out of commission the busy Northwestern Pacific Railroad line which runs through the valley on its way from Eureka to San Francisco.

To halt this moving glacier, 6,000x1,200 ft in area and 1,700 ft above the tracks, the railroad is spending $3,000 a day, using in the round-the-clock struggle 70 men, 5 Caterpillar D8 tractors with dozers, 2 D6s with dozers, an International TD14 tractor-dozer, 1 ½-yd Northwest shovel, 2 ¾-yd American ditchers and one 1½-yd American gopher.

While crews are terracing the glacier and draining off the accumulated water, the tracks have been kept in line and freight and passenger service maintained.

DOZERS TAKE OVER and push material deposited by shovels into the swollen rapids. Although 7,000 yd of earth is dumped daily, the flow of the river is not impeded.



HEAVY WATERFALL is part of drainage system installed in 1938 when tracks were blocked for 73 days by similar slide. Crews have now added 2,950 ft of drain pipe to original facilities.

FREIGHT TRAIN PROCEEDS slowly across slide area. Between passages of trains section crews fight back slide and anchor down rails against movement of earth and rocks. Tracks have been pushed out of line repeatedly.

Le Roi Air Power helps beef up your profits

Le Roi-CLEVELAND Sinkers — with their strong rotation, powerful blow, fast drilling speed, and easy holding, have what it takes to drill more feet per shift. Shown is the 18-lb. H-22 in a stone quarry. Le Roi-CLEVELAND Sinker sizes range from 18 to 80 lbs.

Le Roi-CLEVELAND DR-30 Wagon Drill — Air-powered by a 600-Airmaster, this wagon drill puts deep holes down faster, with less air than any other wagon drill available. Its 4-inch bore, Le Roi-CLEVELAND Drifter has strong rotation, powerful hole-cleaning ability and high drilling speed with big bits. For shallow holes, the lightweight Le Roi-CLEVELAND DR-34 is available.

Le Roi-CLEVELAND Paving Breakers — really pack a wallop. They are available in sizes from 18 to 80 lbs. Their powerful force of blow is ideally suited for the toughest concrete. This feature, plus easy handling, makes them a favorite with operators who like to get a lot of work done. A protective air cushion in the front end keeps maintenance costs to a minimum.

Le Roi-CLEVELAND SB30 Pipeline Rig — This adjustable, multiple drill rig, consisting of four, 4-inch, air-feed drifters hung from a side-boom tractor, was pioneered and developed by Le Roi-CLEVELAND for trenching in hard rock. Because of its flexibility and drilling power this rig is also ideal for cutting costs on road jobs or wherever you have big rock cuts. On this road job in Pennsylvania the SB30 drilled 275-300 feet per hour.

LE ROI GIVES YOU MORE FOR YOUR MONEY!

More air power!
More footage!
More profits!

Le Roi Airmaster running 2 Le Roi-CLEVELAND Model 52 80-lb. breakers. Airmasters are available in 85, 105, 125, 185, 210, 250, 365, and 600-cfm sizes; gas or diesel.

...that's why it pays you to use Le Roi Airmaster Compressors and Le Roi-CLEVELAND Air Tools

YOU'VE probably said to yourself, "What equipment do I need to meet competitive bidding — how am I going to improve my profit picture?"

Well, Le Roi has the answer, when it comes to your air power needs. We build the widest range of portable air compressor sizes and models available. You have 8 sizes and 14 models to choose from. You can pick the machine exactly suited to your job requirements — the machine that does the most work at the least cost to you.

And so that you can get the most out of the high efficiency that's designed and built into every Le Roi Airmaster, we recommend the use of Le Roi-CLEVELAND Air Tools. These tools — sinkers, breakers, drifters, tampers, wagon drills, spades — all have their own exclusive valve design. That's why they are easy to hold, why they have the right kind of blow, why they squeeze the most out of Le Roi air power, why they get more work done.

Yes, Le Roi can help you beef up your profits. Find out for yourself what Le Roi can do for you. See your Le Roi distributor or write us.

LE ROI COMPANY MILWAUKEE 14, WISCONSIN

A Subsidiary of Westinghouse Air Brake Co.

Plants: Milwaukee • Cleveland—Greenwich—Dunkirk, Ohio • Coldwater, Mich.

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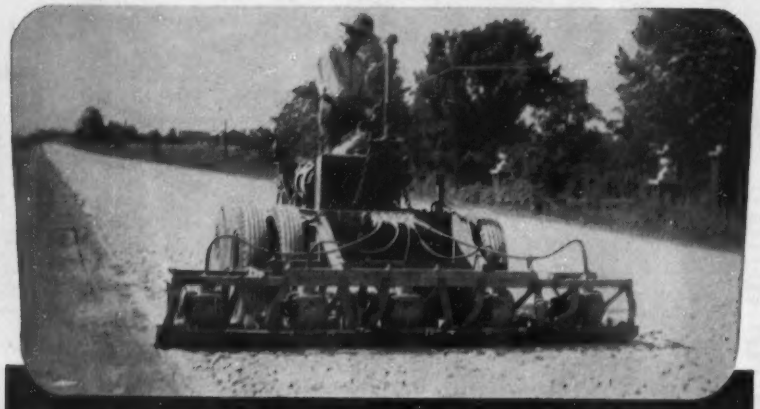
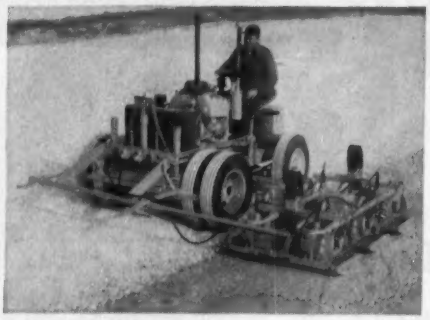


The JACKSON VIBRATORY COMPACTOR
FAST • EFFICIENT • VERSATILE

ON MACADAM CONSTRUCTION . . . In one pass it will sufficiently compact 12" of rock to support smooth rollers. In four passes it achieves final density. And when sufficient fines are spread, one pass suffices to fill all voids. In GRAVEL SUB-BASES (blanket course) 7" thick, this machine has achieved 98% Standard Proctor in one pass. Standard width is 13', 3". Working speeds: 0-60 F.P.M. Reverse travel speed: 5½ MPH.

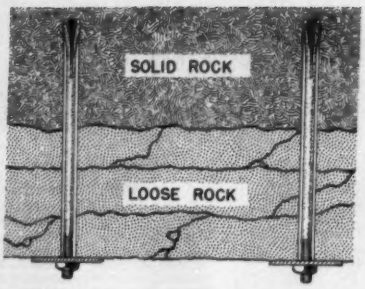
COMPACTS WIDENING STRIPS IN ONE PASS . . .

IN ANY GRANULAR MATERIAL used in flexible base-course widening. For this purpose compacting units are assembled in tandem, (3 deep, single or double row) and towed at side of tractor. Compactor bases of 12" and up may be substituted for standard 26" bases to suit requirements.



SAND FILLS, SUCH AS BRIDGE APPROACHES . . . another spot in which this machine shines. It's rapid and gets into places inaccessible to larger equipment. For the really tight spots one or more of the compacting units may be fitted with operating handles and used as self-propelling, manually guided compactors.

See YOUR JACKSON DISTRIBUTOR or write to us for complete details
JACKSON VIBRATORS, Inc.
LUDINGTON, MICH.



Rock Bolting

TWO COMPANIES, Ingersoll-Rand and Bethlehem Steel Co., are offering excellent literature covering the subject of rock-bolting procedures, techniques and equipment used in rock tunneling and mining operations. (Also see CM&E Dec. 1951 and March 1952.)

Briefly, rock bolting can be likened to fastening several timber planks together to make a strong laminated beam. Long wedge bolts are placed in pre-drilled holes in a tunnel roof to fasten rock layers together, thus developing an arch action that prevents ravelling of the crown and haunches. The bolt is anchored by driving it against the end of the drilled hole to expand its slotted tip with a steel wedge.

Advantages of rock bolting claimed are: Better roof support, lower cost, less installation times, less bull work involved, less storage space required for material, cost of material handling is reduced, safer, no timber to knock out, no big steel pieces to handle and place, rock bolts will outlast wooden timber, more room in working area, improved ventilation and rock bolting permits changing to less expensive method of mining or excavation.

The main disadvantage of rock bolting is that the condition of the bolt in the hole cannot be determined. There is no visual warning of the support taking weight, usually given when conventional timbering is used. Bolts taking weight will usually "sing" giving an effective warning. The bolts will not work in extremely blocky and loose formation where no solid anchor can be found, nor will they work where the rock sluffs away leaving only a "toadstool" over the bolt.

Both booklets are highly recommended for informative reading. Write to: Ingersoll-Rand, 11 Broadway, New York, N. Y., and request Form 4155 and to Bethlehem Steel Company, Bethlehem, Pa. for Form 293.

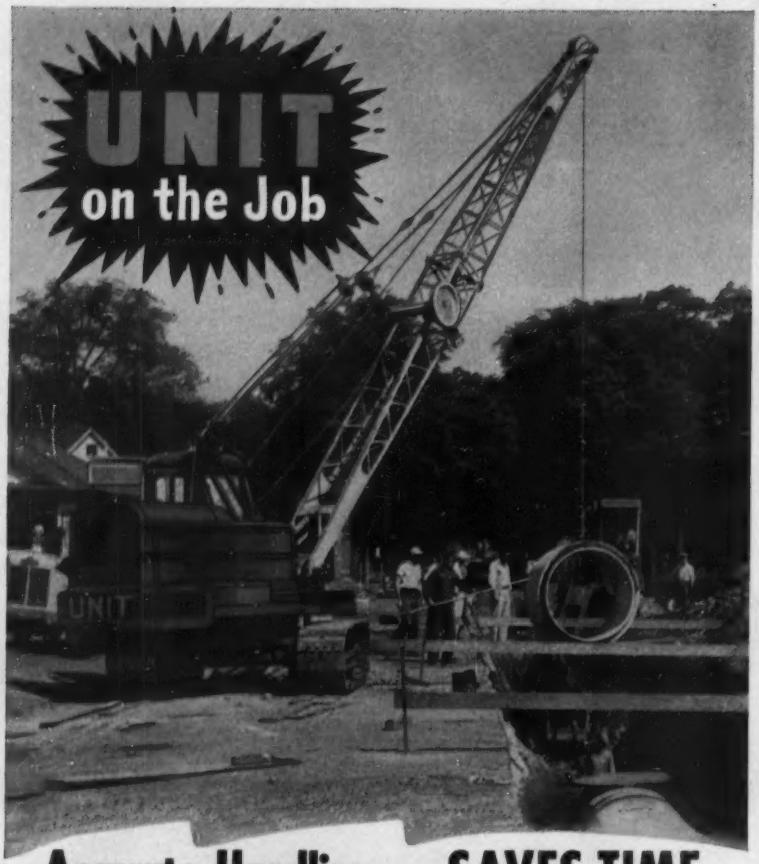
Wire Rope at Work—The Normanskill Creek Bridge, just south of Albany, is one link in the great New York State Thruway, a superturnpike from New York City to Albany, then west across the state. When this photograph was taken, the final gap was being closed in the 623-ft bridge, which spans both the Normanskill Creek and a railway right-of-way. D. A. Collins was the general contractor.

Here, as at so many other points along the route, Bethlehem wire rope was right in the thick of things. For hoisting the structural members, 6 x 25 Purple Strand Form-Set was used, and the rope proved a strong and able worker—just as it always does on lifting and hauling jobs in every type of industry.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • PETROLEUM • MINING • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING



Accurate Handling . . . SAVES TIME

This sturdy UNIT Crawler Crane offers plenty of power plus accurate control. Spots heavy sewer pipe perfectly into the desired position. Adjustable Hook Rollers, Extra Long Crawlers and Wide Multiple Hinged Crawler Shoes provide all-around stability. Full Circle Swing, controlled from within UNIT'S FULL VISION CAB, provides safe and efficient operation. The operator has a complete view of the entire job at all times. GET THE FACTS! Investigate this modern UNIT and its many features. Write today for literature.

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½ or ¾ YARD EXCAVATORS . . . CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

STUD WELDING of the Cofar corrugated steel forms and frames was done in a single operation, as shown here.

Corrugated Steel Forms for Concrete Floors

CORRUGATED STEEL FORMS for concrete floors, called Cofar, was effectively demonstrated recently for members of the American Concrete Institute in Denver, Colo., at the construction site of the new Denver Club Building.

The forms, made by the Granco Steel Products Co., of Granite City, Ill., were placed by a crew of six ironworkers and two carpenters, about 1/6 the force that would have been needed using wood forms. The eight-man crew installed the forms on each of the 20 floors in 1½ days.

The outside dimension of each floor is 125x125 ft. Typical span for the forms, which were delivered to the job site cut to fit the steel frame of the building, was 8 ft 4 in. The forms weigh 2 lb per sq ft, were fastened to Nelson studs and to the steel framework. The welding of the forms to the studs and frame was done in a single operation.

The Cofar forms are deep-corrugated units with transverse temperature wires welded across the

EACH FORM, measuring 8 ft 4 in., weighed 2 lb per sq ft. Forms for 20 floors were installed by 8 men in 1½ days.

corrugations. In addition, ⅜-in. reinforcing steel bars were placed before the concrete was poured.

Temporary wooden shoring, built between each span, was removed a week after pouring concrete.

A slab of concrete, 4½ in. thick, made of lightweight aggregate, was poured on the corrugated steel. The concrete, using a burned clay aggregate, weighed 105.6 lb per cu ft when wet. The mix was 564 lb (6 sacks) of cement, 1.5 pozzolith, 1,-895 lb (31.8 cu ft) clalite and 440 lb (53 gal) of water. This concrete had a slump of 1.5 in. and air entrained 6.5%.

According to E. E. Stansbery, resident engineer, the light concrete floors did not save any particular amount of steel, but they did permit substantial saving in the size and cost of the foundation because of the lighter load. Reduced overall tonnages also make an appreciable saving in materials handling costs—sometimes a sizable expense.

COMING — In July

Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance. The theme will be "Productive Maintenance."

WATCH FOR IT!

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C. H. & E. MANUFACTURING CO. Milwaukee, Wisconsin
CARVER PUMP CO. Muscatine, Iowa
CHAIN BELT COMPANY Milwaukee, Wisconsin
CONSTRUCTION MACHINERY CO. Waterloo, Iowa
ESSICK MANUFACTURING CO. Los Angeles, California
THE GORMAN-RUPP CO. Mansfield, Ohio
THE JAEGER MACHINE CO. Columbus, Ohio
LEYMAN MANUFACTURING CORP. Cincinnati, Ohio
MARLOW PUMPS Ridgewood, New Jersey
FOOD MACHINERY AND CHEMICAL CORPORATION *Peerless Pump Division* Los Angeles, California
RICE PUMP & MACHINE CO. Belgium, Wisconsin
STERLING MACHINERY CORP. Los Angeles, California
WORTHINGTON CORPORATION *Concrete Machinery Division* Plainfield, New Jersey

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YOU'LL SAVE TIME AND EQUIPMENT with a

GXTT!

MODEL GXTT—14 THRU 22-TON CAPACITIES . . . Gooseneck type tilting platform cargo carrier equipped with two double-acting hydraulic cylinders cushion trailer platform when tilted, with or without load. Saves time—saves equipment—one-man operation. Exclusive "THANSPORT" tandem axle assembly gives both lengthwise and crosswise oscillation.

WRITE FOR COMPLETE INFORMATION

TRANSPORT TT TRAILERS INC.
CEDAR RAPIDS IOWA, U.S.A.

Insley Model WB Fluid Coupling-equipped Crane . . . example of cooperation between machinery manufacturers and Twin Disc in developing more efficient, longer lasting equipment.

LOADS 17 MILLION Ft. through a Twin Disc Fluid Coupling

Fluid Couplings—capacities ¾ to 700 hp.

...original cables still good!

"Our Crane is one of the first Insleys driving through the Twin Disc Fluid Coupling. In 13 months it has handled more than 17 million feet of timber . . . and the original cables are still in good, serviceable condition.

"This machine has handled 35-ton loads. We are so proud of its performance that we took it 70 miles to our local Logging Show and demonstrated it."

That's the report of C. J. Lindsey of Montgomery Creek, Calif., regarding his Insley WB with logging attachment mounted on a Maxi carrier and driven by a Caterpillar D-318 Diesel through a Twin Disc Friction Power Take-Off and a Model 17.5" Twin Disc Fluid Coupling.

Friction Power Take-Offs—capacities to 650 hp.

TWIN DISC CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

On-the-Job Contractor-Labor Relations

by LEON B. KROMER, JR.

Cooked

A POLITICAL HOT POTATO got shoved back into the oven last month even before the cooks had a chance to toss it around a bit. A solid block of Democratic senators plus three Republicans proved too strong for supporters of the President's program to revise Taft-Hartley. With very little debate, by a vote of 50-42, the bill was sent back to the Labor Committee. With it went the changes proposed for the construction industry (CM&E Feb., p 132). Only the strongest kind of pressure from the White House could bring the bill out of committee again during this session. No such pressure is going to be exerted.

Senator Knowland, Republican leader, was quoted as saying that the action of the Democrats killed the legislation as far as this session goes. Senate Labor Committee Chairman Smith (R., N. J.) indicated that he felt "as cheerful as a dickey bird" and didn't think "we should strain our gizzard out in the light of this defeat."

Meanwhile, the House Labor Committee is reviewing the Act section by section, not confining itself to the President's recommendations. However, unless there is some indication of further action being taken by the Senate, no changes will be reported out by this committee.

Express the Intent

With no amendments being made to meet the special needs of the construction industry, contractors who endeavor to follow established practice in negotiating agreements and hiring workmen will continue to be faced with possible unfair labor practice charges. If you are in this category your best bet is to try to sell the building trades unions during bargaining sessions on including in the contracts such hiring clauses and union security provisions as express the intent of complying with the Act.

Thus, for example, a collective agreement contained this provision: "The party of the first part (the employer) agrees to hire only

(Continued on page 168)

"We solved this problem by eliminating 5 different oils"

Here is the case of a large Pennsylvania contractor, so thoroughly mechanized that even his wheel-barrows were gasoline powered. And strangely enough, this intense mechanization was the root of the company's problem. Too many different types of oil were resulting in confusion and *misapplication.*

On one of his periodic visits, Sinclair Lubrication Engineer Harry Donovan was asked for his recommendations. Mr. Donovan reports, "It was plain that the perfect solution would be *one oil* suitable for heavy duty diesel, medium duty gasoline and light duty air-cooled engines.

Mr. Donovan continues, "I suggested SUPER TENOL®, knowing from previous experience that it would offer maximum protection against cold engine sludge in the lighter operations . . . and provide the necessary film strength and anti-oxidant qualities needed in the heavy duty diesel operations. The company accepted my recommendation and *eliminated 5 different oils.* Moreover, SUPER TENOL has prevented any further confusion or misapplication of oil."

SINCLAIR LUBRICANTS

Why not give a Sinclair Lubrication Engineer the chance to help solve your lubrication problems. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

For the Best Service under the Worst Conditions

Chrome-Clad LUFKIN "Peerless" Engineers STEEL TAPE

An extra strong, ¼" wide Chrome-Clad line built up by a series of electroplatings — most rust and corrosion resistant — will not chip, peel or crack — easy to clean! Jet black markings bonded right to the line — can't wear off — easy to read against the chrome-white surface! Preceding foot number is repeated each inch or tenth.

These features add up to the Lufkin "Peerless" — a durable steel tape made for engineers. Available in 50, 100, 150 and 200 ft. lengths. Two finger rings furnished for use without the frame.

BUY LUFKIN TAPES • RULES • PRECISION TOOLS FROM YOUR SUPPLY STORE
277
THE LUFKIN RULE CO., Saginaw, Michigan
132-138 Lafayette St., New York City • Barrie, Ontario

NOW...More Power...More Speed and DIGGING DEPTH Increased to 12 ft.

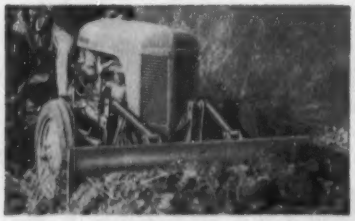
- ADAPTABLE TO MOST ALL TRACTORS!
- ELIMINATES NEED OF AN OVERDRIVE!

U. S. Patent 2,669,367

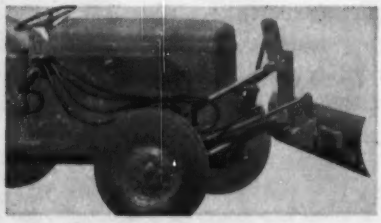
- LARGE HYDRAULIC PUMP!
- FASTER DUMPING ACTION!

SCOUT DITCHER

Extra speed...extra power, plus extra digging depth in the smooth handling Scout 70 makes it ideal for use on any project where fast digging is required. The Scout 70 may be installed or removed from almost any tractor in approximately 20 minutes. A variety of bucket sizes are available for both rock and earth digging.



Backfill and level with the Shawnee Bulldozer. Hydraulically operated up and down.



UP, DOWN, angle RIGHT or angle LEFT, all hydraulically controlled from driver's seat. Blade may be tilted or extended right or left manually.

See your local dealer or write for free literature:

SHAWNEE MANUFACTURING CO., INC.
1947SS North Topeka Ave. • Topeka, Kansas

LABOR . . . Continued from page 166

members of local union No.—." Closed shop? Yes. Leave out the word "only" and chances are that you won't be pinned down with a Taft-Hartley violation solely on the wording of the clause.

Another agreement puts it this way: "When the employer employs members of the union, the following terms and conditions shall apply: The employer shall employ only such workmen as are members in good standing with the (union) under the terms and conditions and at the rate of wages herein provided. . . ." Note the word "when." It's important and may get you around a charge of violating the closed-shop provision of the law.

It's obvious that you will have to live with the present labor law for some time to come even though its representation and certification requirements cannot be followed in the construction industry. So it will pay to try and get the unions to agree to contract clauses that comply with the Act. Otherwise, it can cost a lot of money.

Negotiations— 1954 Style

Wage negotiations for the spring of 1954 are following the pattern of 1953 with contractors resisting high wage increase demands—in some cases willing to face strikes in attempting to settle at lower levels. It is apparent from talks with contractors that increases in labor costs are not being passed on to the owners but are being absorbed. As one contractor expressed it, "To get a job in today's competitive market, you can't put into your estimate any higher labor costs—they come out of your hide."

While wage increases for 1953 averaged around 12½-15c, increases this year seem to be hitting around 7½-10c. A general construction strike in Columbus, Ohio, was ended when the major trades agreed to settle for a 10c hourly wage increase; all trades in Syracuse, N. Y., except carpenters, settled for 10c; Albany, N. Y., 7½ to 10c for major trades; northern and central California laborers for a 10c package—5c May 1, 2½c Aug. 1 and on Feb. 1, 1955 an additional 2½c addition to the present welfare contributions of 7½c. In Oregon and part of Washington, carpenters and allied trades accepted a 10c increase.

Overtime on Federal Construction

Contractors who perform construction work financed by the federal government have been able in some cases to work laborers and mechanics 56 hr a week without paying any overtime. This is due to the fact that the work being done by the employees was not covered by the Wage-Hour Law. The Eight-Hour Laws that do apply say that the contractor must pay at least time and one-half for work in excess of 8 hr in one day. Working seven 8-hr days gets around that.

The Secretary of Labor tried to plug the loophole by suggesting to Comptroller General that government contracts require payment of overtime after 40 hr of working a week. In turning down the suggestion the Comptroller General pointed out that Congressional appropriations should not be used for the betterment of working conditions, but for the purpose for which they were intended. The inference is clear that plugging loopholes should be done by Congress.

Contractors covered by collective agreements do not, of course, work such hours without payment of overtime. Most agreements generally provide for payment of overtime compensation for work after 8 hr a day and 40 hr a week.

Fire-Resistant Paint

A NEW FIRE-RESISTANT PAINT, known as Warco Duo-Tex, provides maximum fire and flame protection when applied to interior walls, ceilings and trim surfaces, according to the manufacturer, The Warren Refining & Chemical Co. of Cleveland, Ohio.

Composed of an intimescent resin base, the paint will swell, char, bubble, producing a protective charred ash which guards the surface from the flame.

The paint is said to be as simple to use as ordinary paint and may be sprayed or brushed on, dries to a flat finish and is washable It will also resist mildew and fungus growth and will maintain its fire-retardant quality with age.

It carries the Underwriter's Laboratory seal and meets the fire-resistant demand of Federal Government specifications SSA-118A.

Insurance costs too high?—

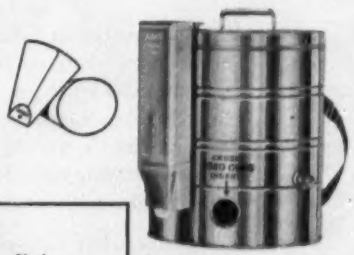
Want to **do something** about it?—

As easy as taking a drink of water!

Right! Because the National Safety Council has confirmed that safety messages *that get read* (like the one on the crisp clean AJAX Cup this worker is using) definitely do help reduce accidents. And *you know* that fewer accidents result in lower insurance costs. So . . .

Why don't you use AJAX Cups to put your safety messages right in your worker's hand — where he'll see them several times a day, at moments when he is relaxed, receptive, ready to read? And he'll really appreciate the comfort, convenience and complete sanitation of these easy-to-drink-from AJAX Cups, too.

AJAX® Cups and AJAX Drinking Water Tanks deliver fresh cool water to workers—mean less time lost on the job. AJAX Cups and dispensers are also ideal for stationary tanks, barrels, pipeline faucets. 4 oz., 6 oz. and 7 oz. sizes packed imprinted with assorted stock safety messages—or your own message to order.



A TYPICAL EXAMPLE

(Actual case history from insurance company files)

A steel construction firm in one year paid insurance premiums of $3751. This included a charge, above the manual rate, of 10.8%. The next year — despite a 5% increase in manual rate — their insurance cost only $3191 . . . because an active accident-prevention program had earned them a credit of 10%, saving hundreds of dollars in cost!

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SILVIUM®

cuts grid corrosion . . .

puts extra months and miles

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EXIDE's corrosion-fighting grid alloy, SILVIUM, puts an entirely new slant on how long a battery can really last! SILVIUM shackles the most destructive enemy of batteries—grid corrosion caused by overcharging. With SILVIUM, an Exide patent, the life of ULTRA START® Batteries is multiplied. Actual operating records show 90,000 . . . 100,000 . . . even 170,000 miles without a recharge!

No matter what batteries you're now using, you owe it to yourself to switch to ULTRA START. There are Exide ULTRA START Batteries to slash your battery costs . . . reduce your down time. Get full details now from your nearest Exide Distributor. He is listed in the yellow pages of your phone directory.

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THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2, Pa.
Exide Batteries of Canada, Limited, Toronto

Exide® BATTERIES

SALES AND ★SERVICE★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

S. Paul Hydraulic Hoist: Florig Body Works, Norristown, Pa. has been appointed distributor for St. Paul hoists and bodies, Pax-all refuse collection bodies and the St. Paul Frate-Gate in Bucks, Chester, Delaware and Montgomery Counties, Pennsylvania.

LeTourneau-Westinghouse Co.: Has appointed Construction Equipment Co., Ltd., 1580 Albert St., Regina, Sask. as distributor to supply earth-moving equipment to contractors and other users throughout that province.

Cleaver-Brooks Co.: Has appointed General Equipment, Inc., Baton Rouge, La. as distributor for their road machinery equipment in Louisiana. Also the Leary & Owens Machinery Co., Inc., Birmingham and Montgomery, Ala. will handle their road machinery in ten northwestern counties in Florida and in Alabama.

Concrete Sawing Equipment, Inc.: Announces the appointment of Seals, Inc., Baltimore, Md. as distributor for the complete line of CONCUT Concrete Saws and FOOTHILL Concrete Sawing Blades in Maryland.

The Galion Allsteel Body Co.: Schweigers, Inc., Watertown, S.D., have been appointed distributors of Galion Allsteel hydraulic hoists and dump bodies for South Dakota. They will offer complete parts and repair service, as well as handling new equipment sales. Also appointed was the Power Brake Service, Inc., Cleveland, O. as distributors in northern Ohio of hydraulic hoists and dump bodies. They will offer complete parts and repair service, as well as handling new equipment sales.

Baldwin-Lima-Hamilton Corp., Construction Equipment Div.: Announces the appointment of Bradley Equipment Co., 1042 West Marietta St., N. W., Atlanta, Ga. as distributor for LIMA shovels, cranes, draglines and pull shovels in central and northeastern portions of Georgia.

Worthington Corp.: Recently executed a distributorship agreement with May-Money Machinery Co., Chickasaw, Ala., to handle Worthington construction equipment, including concrete mixers, road pavers,

(Continued on page 176)

New small unit

...DOES A BIG JOB!

Whiteman QUALITY!

...IN A SMALL UNIT!

...AT A LOW PRICE!

PROFITABLE EVEN ON SMALL JOBS!

BRAND NEW!

WHITEMAN Model "M" TROWELING MACHINE

Now even *small* concrete finishing jobs can be done faster, more efficiently, more profitably by machine! The brand new Whiteman Model "M" Troweling Machine is a *small* unit that does a *big* job. 29" trowel diameter permits use in crowded areas while giving adequate coverage for smooth, level finishing and efficient operation. A quality product of Whiteman, pioneer and builder of the first successful troweling machines... a result of 17 years experience and good sound engineering. Ask your Whiteman distributor about the new Model "M."

- EASY OPERATION. Even an amateur can do a good finishing job with the Model "M."
- LIGHT WEIGHT. Makes it possible to get onto the slab much sooner than with any other machine.
- EXTRA POWER. Famous Continental engine. Surplus power permits floating or finishing at very slow or high speeds, as desired.
- COMBINATION BLADES. Can be used for both floating and finishing by simply adjusting pitch.
- NON-SKID WEAR SHOES. Reduce wear at base and assure perfect trowel alignment.
- ADJUSTABLE PITCH. Trowel pitch adjustable by knob at top of handle with reaching in motion. (Exclusive Whiteman feature.)

Whiteman

POWER BUGGIES

SCREEDING MACHINES

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of distributor for ☐ Troweling machine, ☐ Floating-finishing machines, ☐ Screeding machines, ☐ Power Buggy.

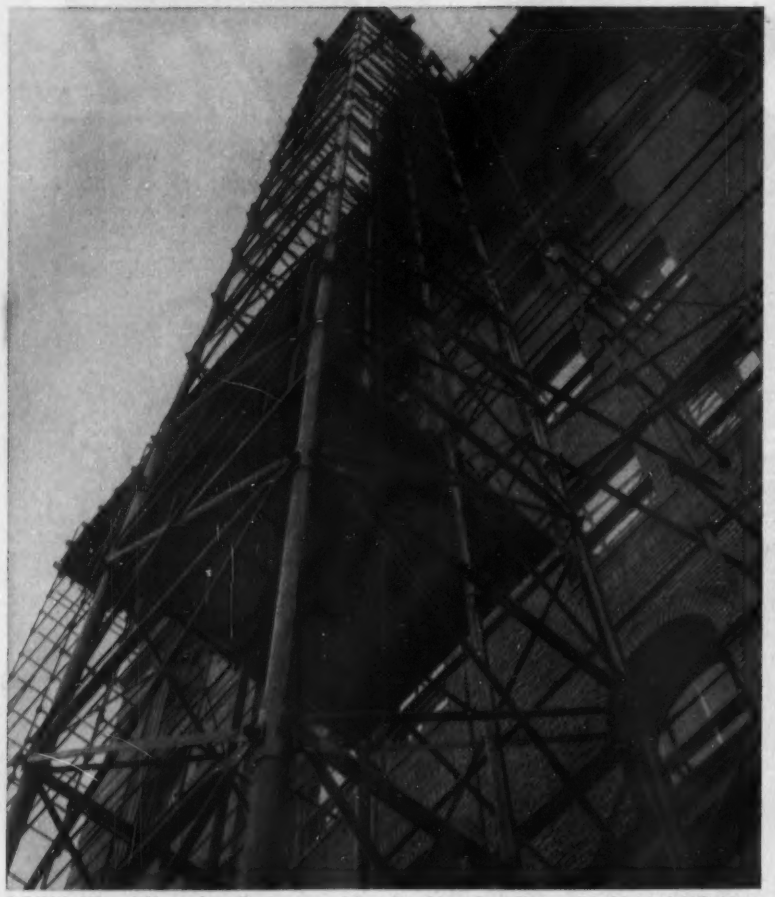
Name_____

Firm_____

Address_____

City_____ Zone____ State_____

(Advertisement)



GOING UP quickly and easily is no problem for this safe, efficient "Gold Medal"® Hoist Tower on San Pedro (Calif.) City Hall job. TubeLox Scaffolding was used in conjunction with tower. C. J. Fagstad was the contractor.

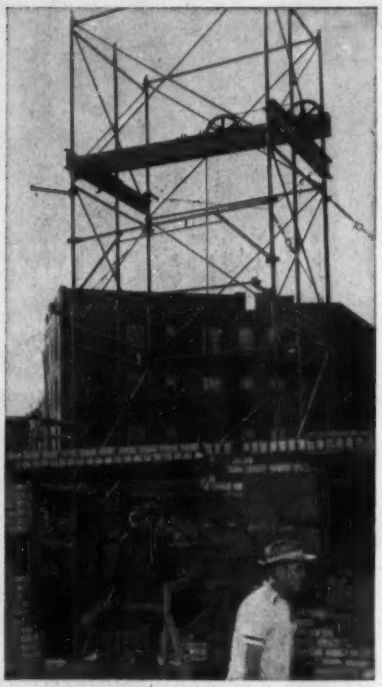
THIS HEAVY DUTY "Gold Medal" Hoist Tower on Western Pacific's office building is used for lifting concrete, rises 143-ft. above street. Easy to assemble, it provides tremendous strength to meet load requirements.

Steel Hoist Towers Speed Concrete Pouring, Masonry

TO RAISE CONCRETE for a one story and penthouse addition on Western Pacific Railroad's home office building in San Francisco, general contractor N. H. Sjoberg & Son took no chances with safety or efficiency and specified a "Gold Medal" Steel Hoist Tower.

Built up to a 143-ft. height, this tubular steel tower offers advantages of great strength, quick assembly of prefabricated parts and completely safe service. Assembled from steel horizontal girts, diagonal braces, bolted tower legs and base sills, the "Gold Medal" Tower can be built up to extreme heights and meets load requirements up to 5000 lbs. They can be equipped with cages, or with concrete bucket and hopper.

For light duty service, contractors now specify the new "Trouble Saver" Sectional Steel Hoist Tower. This prefabricated, easily-erected tower has a 130-ft. maximum height, a 4000 lb. load capacity and full three-wheelbarrow width combined with unusual safety and labor-saving features. From heavy to light duty, PS Steel Hoist Towers are best for the job. Remember, when it comes to scaffolding, come to PS.



NEW LIGHT DUTY "Trouble Saver" Sectional Steel Hoist Tower speeds mortar to masons on 6-story apartment house. Kew Gardens, N.Y. Paul A. Cardone was the brick mason contractor.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

GOLD MEDAL LADDERS SCAFFOLDING

THE PATENT SCAFFOLDING CO., INC.

38-21 12th Street Dept. CM&E Long Island City 1, N. Y.
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Branches in all principal cities

To help you solve any scaffolding problem, PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

FINANCIAL AID TO HIGHER EDUCATION

What Business Can Do to Help Our Colleges and Universities

Is the financial squeeze now gripping our colleges and universities grave enough to warrant direct action by the business community? If so, what can business do about it? This editorial is addressed to these two questions.

In the previous editorial in this series of two, it was demonstrated that **our colleges and universities, and particularly the independent institutions, face financial difficulties, which, unless relieved, promise to get progressively worse and might ultimately result in a national disaster.** This state of affairs obviously gives the business community a crucial stake in helping to relieve the plight of these institutions. For our business organizations can be no stronger than the total community of which they are a part.

It does not follow automatically, however, that every business firm should give direct financial aid to education. Already the business structure is heavily burdened with activities unrelated to its main purpose. These include acting as tax collector for more than $65 billion of federal, state and local taxes in the year 1953. There is a limit to the amount of such public enterprise that can be loaded on the business system.

Business Holds Key to Answer

If, however, the survival of a key part of our educational system depends on its having financial help from the business community, that help should be provided. And this is the situation of our independent privately endowed colleges and universities.

Of course, our tax-supported institutions of higher learning must also be kept strong, financially and otherwise. But they have recourse to public support not available to the independent institutions. Largely on this account, their present financial difficulties are much less acute than those of the independent colleges and universities.

These independent institutions have seen price inflation eat away much of the value of their endowments. Moreover, there is no prospect that these endowments can be sufficiently replenished by gifts from the wealthy people who provided them in earlier years. Progressive income and estate taxes have seen to that. Thus, they are faced not only with a peculiarly acute financial problem, but also one which cannot be solved except by tapping other sources of aid.

Tax Support No Solution

It is conceivable that the independent colleges and universities might solve their financial problem by seeking support from tax revenues. If they did this, however, they would lose their distinctive character as independent institutions, and our system of higher education would lose one of its major elements of strength. That is the existence in our educational system of both independently financed and tax-supported colleges and universities. Each has its special contribution to make to a well-balanced system of higher education.

(Continued on next page)

Business is directly dependent upon higher education to staff its increasingly complex and exacting operations. A key part in this process is played by the small, independent liberal arts colleges which are the hardest hit financially of all our institutions of higher learning. "These," states the Council for Financial Aid to Education, recently formed by a group of business leaders, "have contributed a high proportion of the intellectual, scientific and religious, as well as business leadership of the nation. Their programs are devoted to the teaching of values, particularly the values of freedom. They are a vital bulwark to our system of free enterprise."

Means of Providing Help

There are many means by which business firms can extend help to our colleges and universities. The most obvious, of course, is to make outright grants of money either to individual institutions or to groups of institutions for such uses as the institutions think best. Another means of help, increasingly employed by business firms, is to establish scholarships to pay the full cost of college or university courses of study. Sometimes the scholarships are open for general competition, sometimes they are limited to employees and children of employees of the firm granting them. Not infrequently those winning the scholarships spend some part of their school vacations working in the companies granting the scholarships.

A number of companies have recently provided for what have come to be called "scholarships in reverse." These companies pay a flat sum to a college or university for every one of its graduates they employ. Financing of university research programs also offers a broad avenue for financial aid to our universities by business.

Need Two-Way Communication

Some business firms have well-developed programs for financial aid to education. But they are exceptional. For most companies the problems involved are new and strange. These companies were created with the basic purpose to make money, not to give it away. Successful philanthopic operations involve a whole set of problems with which they have very little experience. Not the least of these is how to make business a dependable source of financial aid to education, since business has no assurance that the profits of one year will not be losses the next.

Considerations such as these emphasize the wisdom of a recent Industry-College Conference on aid to higher education by business, in making the first of its ten conclusions that "better communication, by direct contact, is needed for each [industry and the colleges] to understand the problems of the other." At this juncture the creation of mutual understanding is much more important than the raising of some money and letting it go at that. The problem of aid to education by business has its immediate urgency, but there is also a long-range program to be developed on which business and the colleges and universities must pull together in the years ahead to find a satisfactory solution.

As stated at the outset, failure to find a satisfactory solution could result in a national disaster. This means that, **to give proper heed to their own future prosperity and the future welfare of the nation, business firms generally must go to work on the problem of financial aid to higher education. They must go to work first, to understand the problem; second, to establish two-way communication with our colleges and universities about it; and third, to develop a program which pays proper heed to the needs and capabilities of both business and higher education.**

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

RECORDS TELL HOW GOOD A MOTOR OIL IS!

Ray Mills, Maintenance Superintendent, holds up dip stick to emphasize his point on good oil consumption.

CASE HISTORY

"Our operating records tell the story of what *we're* getting out of the motor oil we use," says Ray Mills, Maintenance Superintendent of City Bus Company, Oklahoma City, Oklahoma.

And City Bus Company must keep accurate, up-to-date records! Operating over 140 city buses, both diesel and gasoline, on day and night schedules, a careful check must be kept on the efficiency of each vehicle. With a timetable to meet in all kinds of weather and 5,000 miles a month for each bus with idling engines plus low gear stop and go travel, Mr. Mills demands a motor oil that in his own words, "resists oxidation and bearing corrosion as well as holding sludge in suspension."

That's why City Bus Company standardizes on Phillips *66* Heavy Duty Motor Oil in all their buses. The oil they were previously using just couldn't "measure up" to such exacting standards —and the result was inefficient operation.

"We have kept our engines cleaner and engine life has increased considerably since we started using Phillips *66* Heavy Duty Motor Oil," said Mr. Mills enthusiastically. "It has helped reduce over-all maintenance costs greatly. The records speak for themselves."

- Overhauls extended from 65,000 miles to better than 125,000 miles.
- No loss of power from sludge formation.
- Increased life for crankshaft and bearings.
- Oil consumption 35 per cent less.
- Engine deposits reduced considerably.

Find out how Phillips 66 Heavy Duty Motor Oils can help you increase the efficiency of your fleet operation. Write today to: Sales Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

The stop and go travel of city buses puts motor oil to the real test!

Oil for the Engines of Commerce

Phillips 66

PHILLIPS 66 HEAVY DUTY MOTOR OIL

The man behind the gun will tell you...

WHITE GIVES YOU

greater, longer-lasting precision...

Shown, model 7014 with "A" standard. Model 7020, same unit with "U" standard, also available.

yet costs less than other quality engineers' transits

LIKE every White quality-built instrument, these engineers' transits give you greater dollar-for-dollar value than any other comparable unit.

For example: White uses a recently-developed Swiss Dividing Engine to cut graduations into solid silver. This insures super-precision from the beginning, safeguards it through more years of hard field usage.

In addition, White engineers' transits give you internal focusing, covered leveling screws and coated optics. These and a host of other design and operating features combine to give you a transit unsurpassed for ease, speed, accuracy, economy and long-lived dependability. Write for Bulletin 1053 and the name of your nearest dealer. DAVID WHITE COMPANY, 343 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

We offer expert REPAIR SERVICE on all makes, all types of instruments

SALES AND SERVICE . . .

Continued from page 170

portable compressors and air tools manufactured at the corporation's Plainfield and Holyoke Works. Territory covered will include four counties in Mississippi, eight counties in Alabama and three counties in Florida.

General Motors Corp., Euclid Division: Announces the appointment of Pecaut Equipment Co., 900 East 8th St., Sioux Falls, S. D., as their distributor of Euclid equipment for South Dakota.

Chrysler Corp.: Announces the appointment of Coretti-Gross, Inc., of Pelham Manor, N. Y. as franchised dealer for Chrysler Industrial Engines, parts and service in 15 counties of the metropolitan area including New York City .

Harnischfeger Export Corp.: Has appointed Federal Equipment Supplies Ltd., 55 Industrial St., Toronto (Leaside) to handle complete sales and service in Toronto territory, of P&H excavators, including gasoline, diesel and electric-powered machines ranging up to 10-yd capacity. P&H truck cranes are offered in Models from 7- to 35-ton capacity and include P&H Miti-Mite.

Gar Wood Industries, Inc., Findlay Div.: Has appointed C. C. Fuller Co., Chicago, Ill. as distributor for Gar Wood ¾-yd excavators and Buckeye ditchers, spreaders, Finegraders and Hi-Way wideners, in northern Illinois and northwest Indiana. In lower peninsula of Michigan, Telford Equipment Co., Detroit and Lansing, Mich. has been appointed distributor for excavators and Buckeye ditchers, spreaders, Finegraders and Hi-Way wideners. In the Wayne Div. the Albuquerque Truck Equipment Co., Albuquerque, N. M. is new distributor of all Wayne Div. products including hoists and bodies, Load-Packer refuse collection bodies, winches and cranes in 14 counties of New Mexico.

On the Sales Front

International Vibration Co.: Announces the appointment of J. V. Ball as sales manager of Vibro-Tamper sales.

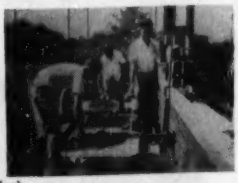
Hyster Co.: Has appointed Les Jensen as eastern division sales engineer. He will work out of the Danville, Ill. factory.

Athey Products Corp.: Has elected W. D. Lease vice-president, Sales and C. E. Matthews, vice-president, Service and Parts.

(Continued on page 178)

Contractor Reports:

33% MORE BRICKS LAID-UP WITH Knickerbocker METAL MORTAR BOARDS



(Pat. Applied For)

- Comfortable working height — reduces fatigue, no stooping
- Smooth, flat working surface—no nail heads or warped boards
- Long life—made of 16 gauge galv. steel
- Increases efficiency—reduces starting and clean-up time
- Demountable legs—easily moved
- Economical—low cost plus long life

PREFERRED BY BRICKLAYERS, BLOCKLAYERS, PLASTERERS, BUILDERS, CONTRACTORS

32" x 32" with 12" legs $7.50 ea.—$81.00 doz.
32" x 32" with 18" legs $8.25 ea.—$90.00 doz.
FOB Parkersburg

KNICKERBOCKER STAMPING CO.
Parkersburg, W. Va.

Erection costs almost nothing

Gordon A. Peterson, Adolfson and Peterson, Minneapolis, Minn., contractors, says: "... we have found that our erection time has been reduced to the extent that erection costs are practically negligible."

BUCK

Automatically-portable, heavy-duty HOISTING MACHINE*

can save hundreds —even thousands of dollars for you—on job after job.

*TRADE MARK REGISTERED

Write for full details — or ask for an on-the-job showing today. No obligation.

BUCK EQUIPMENT CORP.
206 BUTLER STREET
CINCINNATI 2, OHIO

Barber-Greene

standardizes on USS High Strength Steels

for longer wear and better service in road-construction equipment

MODEL 879-A FINISHER. In this universally-used road construction tool, USS MAN-TEN High Strength Steel was selected for two vital parts . . . the screed plates and the receiving hopper.

Since much of the success of the paving operation and the ultimate quality of the road surface reflect the quality of the material and the manufacture which go into the screed plate, it is significant that USS MAN-TEN steel, in ⅜" thickness, was chosen for this very accurately ground and highly polished part.

USS MAN-TEN steel, ¼" thick, was also selected for the bed of the receiving hopper. The abrasive action and general abuse which these bed plates receive make it imperative that they be made of an especially sturdy and long-wearing material . . . a description that exactly fits USS MAN-TEN steel.

MODEL 840 ASPHALT MIXING PLANT. In the "pugmill" of this machine where asphalt and aggregate are mixed, liner plates are subjected to abrasion and wear to an extreme degree. Here too, USS MAN-TEN steel, in ¼" thickness, was the material selected to prolong life. "It has been a point of pride in our design and a feature of our plant advertising that these liner plates, which often cause trouble on 'other' plants are notably *abrasion resistant* and *long-wearing* . . . " says Barber-Greene Company.

● USS MAN-TEN steel—along with its two companion high strength steels, USS COR-TEN and USS TRI-TEN—allows leading manufacturers, like Barber-Greene, to build maximum strength and durability into parts ordinarily prone to failure. With these steels — used singly or in combination—high resistance to fatigue, wear, abrasion and impact can be imparted to all types of construction equipment.

All USS High Strength Steels have a yield point 50% higher than ordinary structural carbon steel. That means by the use of these steels you can materially increase the strength of parts *without increasing their weight*. Or you can use them in lighter sections and *reduce equipment weight* while retaining the same strength as with carbon steel, thus saving substantial amounts of steel.

Contact our nearest office for more information on USS High Strength Steels.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS

USS

4-1231

UNITED STATES STEEL

For all-around utility... the BEST BUY is Ramset

FASTENING SYSTEM

SUPER-POWER JOBMASTER
for heavy-duty work
Operating length 15" Weight 7⅞ lbs.

TWO TOOLS IN ONE
JOBMASTER and PLUS-POWER JOBMASTER
Length 12"
Weight 6¾ lbs.

For your light-duty anchoring work into steel or concrete, requiring ¼" fasteners, the RAMSET JOBMASTER can't be matched for speed, ease, economy and wide versatility.

If ⅜" fasteners are called for, you can have a PLUS-POWER JOBMASTER, or attach a ⅜" assembly to your standard JOBMASTER. Thus you have two tools for slightly more than the cost of one.

Where heavy-duty ⅜" fasteners are needed, the great driving power of the new SUPER-POWER JOBMASTER sets them instantly into 1" mild steel or into the hardest concrete.

Write us or ask your RAMSET dealer for on-your-job demonstration of the all-around superiority of RAMSET SYSTEM for ease, speed, utility and economy.

Ramset Fasteners, INC. Ramset Division Olin Industries, Inc.
12103 BEREA ROAD • CLEVELAND 11, OHIO

FIRST IN POWDER ACTUATED FASTENING

AN Olin PRODUCT

SALES AND SERVICE . . .

Continued from page 176

Blackhawk Mfg. Co.: Has appointed Art Buettner territory manager to cover New York City and Tom Zipf territory manager in Illinois and Eastern Missouri.

Davey Compressor Co.: Has appointed W. J. McClure northwestern district manager in charge of Davey's compressor and air tool sales in the Pacific Northwest.

Kelite Products, Inc.: Announces promotion of William Sorensen to Executive vice-president and R. C. Martin to vice-president in charge of sales. Mr. Martin was also elected to the board of directors of the corporation.

Association Activities

The Asphalt Institute: J. E. Buchanan, now president of the University of Idaho, has been elected president of the Ashpalt Institute.

The Moles: George F. Ferris, president of the Raymond Concrete Pile Co., was elected president of The Moles. Other officers elected were: A. Holmes Crimmins of Thomas Crimmins Contracting Co., first vice-president; Thomas J. Walsh Jr. of Walsh Construction Co., second vice president; James B. Martin of the General Contractors Association, sergeant-at-arms; Harry T. Immerman of Spencer, White & Prentis, secretary and Edward G. Johnson of Arthur A. Johnson Corp., treasurer.

American Institute of Timber Construction: Max C. Hanisch, Jr., president of Unit Structures, Inc., Peshtigo, Wis., was elected president of the American Institute of Timber Construction. Other officers: Charles C. Calvert, president of Summerbell Roof Structures, Los Angeles, a director of AITC since its formation, was elected vice-president and T. C. Combs, president of Arch Rib Truss Corp., Los Angeles, secretary-treasurer of the Institute from its beginning was re-elected.

In the Main Office

Water Seals, Inc.: Frank M. Fucik was elected president of the company at a recent board meeting of the directors. Also elected were Arthur Hoffman, vice-president. E. W. Hillier continues as secretary-treasurer.

Pioneer Engineering Works, Inc.: Carl R. Rolf, has been elected to the Board of Directors of the Company. He currently is vice-president in charge of Sales.

Borg-Warner Corp.: T. J. Ault has been promoted to the presidency and general managership of the Detroit Gear Div.

R/M CONVEYOR BELTS

If conveyor belts are your problem, turn to Raybestos-Manhattan. There are R/M Conveyor Belts with extra cushion for heavy shock loading. R/M Conveyor Belts for mining, quarrying, or bulk materials are unequalled for natural troughing, flexibility and long life. The latest exclusive development of R/M engineers is the "XDC" cover which protects heavy duty conveyor belts against wear, abrasion, cuts and tears to a degree never before attained. Hot material, high tension, long lift, oil or non-spark conditions . . . all are met with special R/M Conveyor Belt designs. Equally good engineering goes into R/M Belts for light duty . . . packages, parts, cases or wood chips. For every use R/M Conveyor Belts give you More Use per Dollar. Consult an R/M representative. Ask him also about R/M Hose, Transmission, V-Belts and other industrial rubber products.

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls RM-417

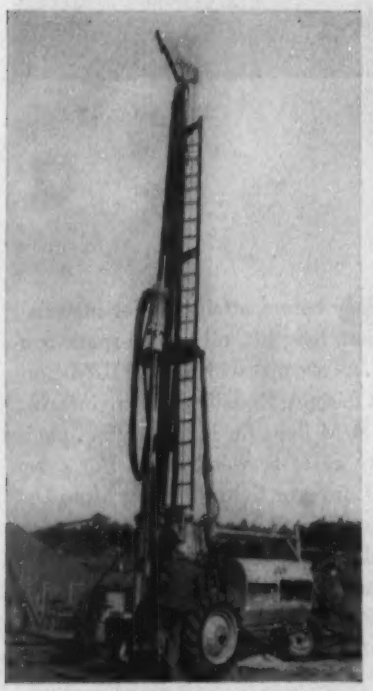
CONSTRUCTION EQUIPMENT NEWS

Power Shovel Action

The basic principle of the 1-yd Dempster-Diggster 101, is the variable crowd action found in power shovels. It can be used as an excavator or front end loader. It's hydraulic, will dig 15 in. below grade and dumps at 9 ft 6 in.—**Dempster Brothers Inc., Knoxville, Tenn.**

New Bottom-Dump Hauler

This Timpte Gilpatrick bottom-dump hauling and spreading trailer is said to double the speed of any spreading operation. It has a hauling capacity of 10-12 cu yd of material. It can be pulled with either truck or tractor.—**Timpte Brothers, Inc., 40th and York Sts., Denver, Colo.**

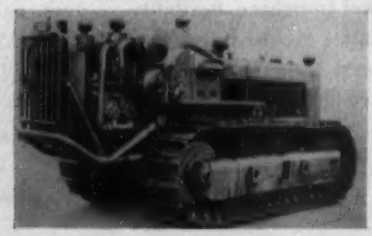


Big Hammer Drill

Claimed to be the largest hammer drill designed is this Joy Challenger blasthole drill. It will drill 4½-in. dia holes to depths of 50 ft in any formation. It's available with 3 mountings.—**Joy Manufacturing Co., Pittsburgh 22, Pa.**

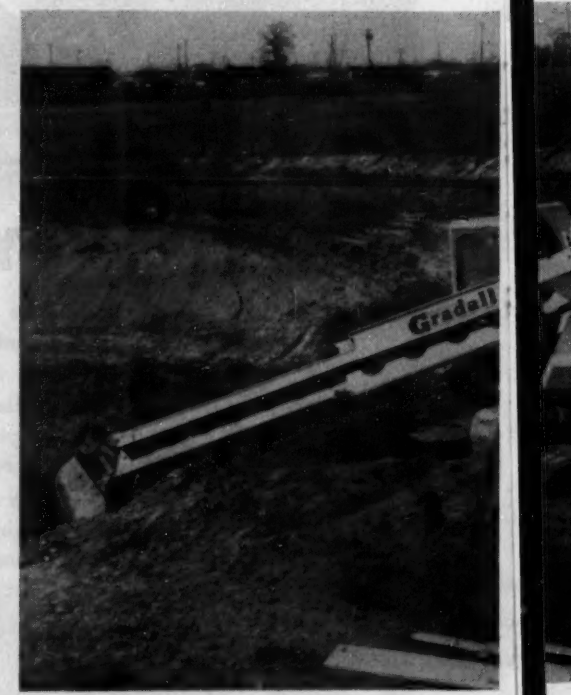
Austrian Crawler

This Motormuli features a front sprocket drive driven by a Graf & Stift 125-hp diesel engine. Top speed is 15 mph with 5 speeds forward.—**Hacker & Co., Carl Platz, Vienna 4, Austria.**



Tractor-Compressor

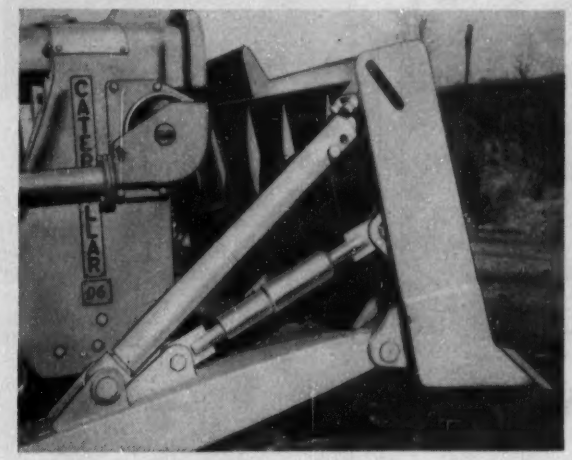
The new LeRoi 600 CTM, mounted on an International TD24, weighs 5,030 lb and is connected to rear power take-off. It can also be mounted on the Caterpillar D8 models.—**Le Roi Co., Milwaukee, Wis.**



Gradall on Tracks

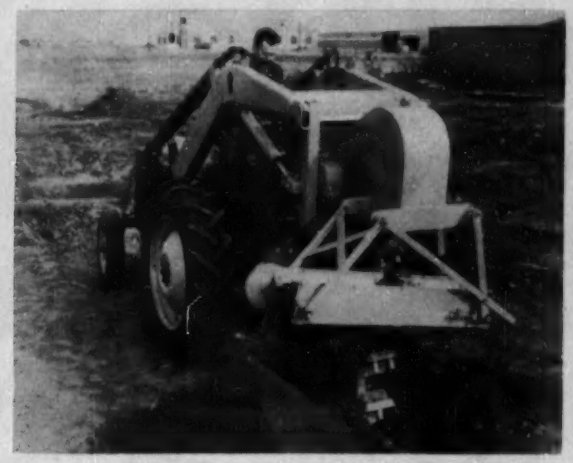
Here is the first crawler-mounted Gradall to go into service in the construction industry. It's powered with 60-hp diesel engine and equipped with 18-in. shoes and a 60-in. ditch cleaning bucket. This model Gradall incorporates a hy-

On-the-Job Previews of Machinery, Tools and Equipment



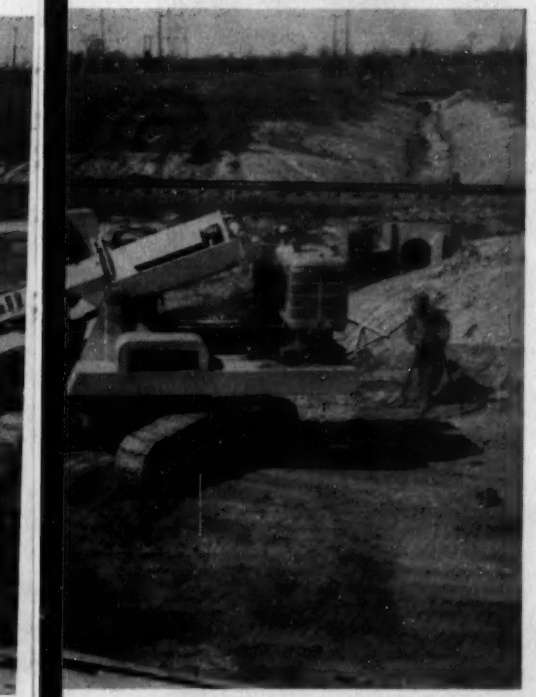
Bulldozer Stabilizer

This stabilizer is designed to eliminate all looseness in adjustable type bulldozers. It can be installed in the field in less than 2 hr. Of all-steel construction, it is available only for Caterpillar D6 and D7 models at present can be adjusted by field personnel.—**Schneckloth Excavating Co., Clinton, Iowa.**

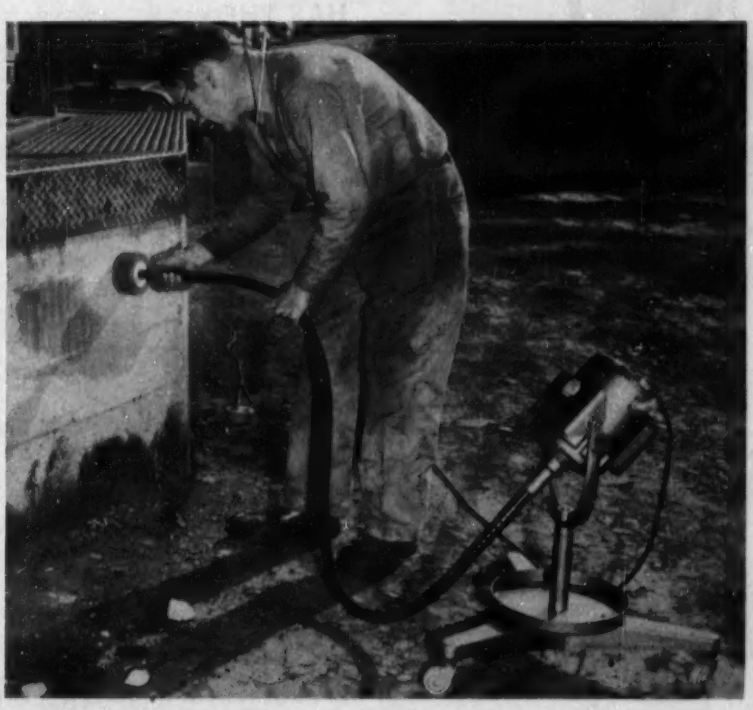


Available with Eleven Attachments

The Davis Pit-Bull, recently introduced, is a basic unit with 11 attachments that include a ⅝-cu yd bucket, backhoe, trencher, 8-ft rotary broom, dozer blade, crane, roller, mower, lift fork, hammer and auger.—**Mid-Western Industries, Inc., 1009 S. W. St., Wichita, Kan.**



draulic drive system controlling the telescoping boom and powers the tracks with the same hydraulic pressure. The unit has two speeds—½ and 1 mph.—**Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.**



Portable-Flexible Grinder

This low-cost portable flexible shaft concrete grinding machine is mounted on 3 castered legs for portability, and comes with a 12-ft flexible shaft with a ⅜-in. core. The long length of the shaft permits use on ceilings and walls. It comes equipped either with an open type or totally enclosed ½-hp motor. Wet or dry angleheads can be used with this machine. The manufacturer claims it is the lowest priced portable concrete grinder on the market.—**Stove Mfg. Co., Binghamton, N. Y.**

only the new

MARVEL

ADJUSTABLE SHORE

HAS THE

COMPLETELY ENCLOSED

ADJUSTING SCREW!

1 Completely encased Adjusting Screw, protected from sand, grit and concrete at ALL TIMES for smoother action . . . completely protected from weather to prevent ruts and corrosion . . . protected from damage in transit and storage.

2 One piece straight Adjusting Bar and Locking Pin provides for faster turning . . . with no time wasted raising and lowering levers.

3 Inner Tube and Outer Tube made of High Grade Steel for utmost strength at minimum weight.

4 No projections anywhere . . . streamlined for greater safety to workmen and to shorten expensive Setting-up and Taking-down time.

It will pay every contractor to replace out-moded shoring equipment with the New MARVEL Adjustable Prop with *"Premium Performance"* because only the New MARVEL has the *Completely Encased* Adjusting Screw built for Life Time Service.

Order Now . . . while prompt deliveries are available.

Available in three sizes . . . Maximum Adjustment to 15 feet.

PRICES UPON REQUEST

MARVEL EQUIPMENT COMPANY

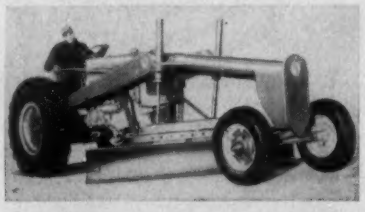
1055 Bowen St. OSHKOSH, WIS. Phone Blackhawk 42-1

BUILDERS OF ADJUSTABLE SCAFFOLDS SINCE 1939

EQUIPMENT NEWS . . . Continued

10,000 GPH PUMP — The Jaeger "Sure Prime" model 2PN is claimed to pump all the water that can be pulled through a 2-in. suction line. It will deliver its rated capacity of 10,000 gal when operating the low speeds of 2,400 to 2,550 rpm. Mounted on 13-in. dia pneumatic tires, it weighs only 190 lb and measures only 24x21x26 in. high. It's powered with a Wisconsin AKN engine. — **The Jaeger Machine Co., Columbus, Ohio**

NEW CAT—The DW-15, a 4-wheel tractor by Caterpillar, is powered with a D326 diesel engine producing 150 hp. The standard transmission gives double speed ranges with 10 forward speeds up to 24 mph and two reverse speeds. Wheelbase dimension on the DW15 is 121½ in. The new tractor has been designed for use with Cat Nos. 15 and 10 Scrapers and W10 Wagon. — **Caterpillar Tractor Co., Peoria, Ill.**



LOW-PRICED GRADER—The M-B Grader is built into the 30-hp Minneapolis-Moline RTI tractor and provides a low cost, practical unit that will handle grading, maintaining and light construction work. It has a 10-ft blade, 4 speeds forward and 1 reverse. The sturdy tubular frame resists twists and shocks, and the engine located between the rear wheels and blade, adds its weight both to traction and blade pressure.—**M-B Corp., New Holstein, Wis.**

roadways made easy

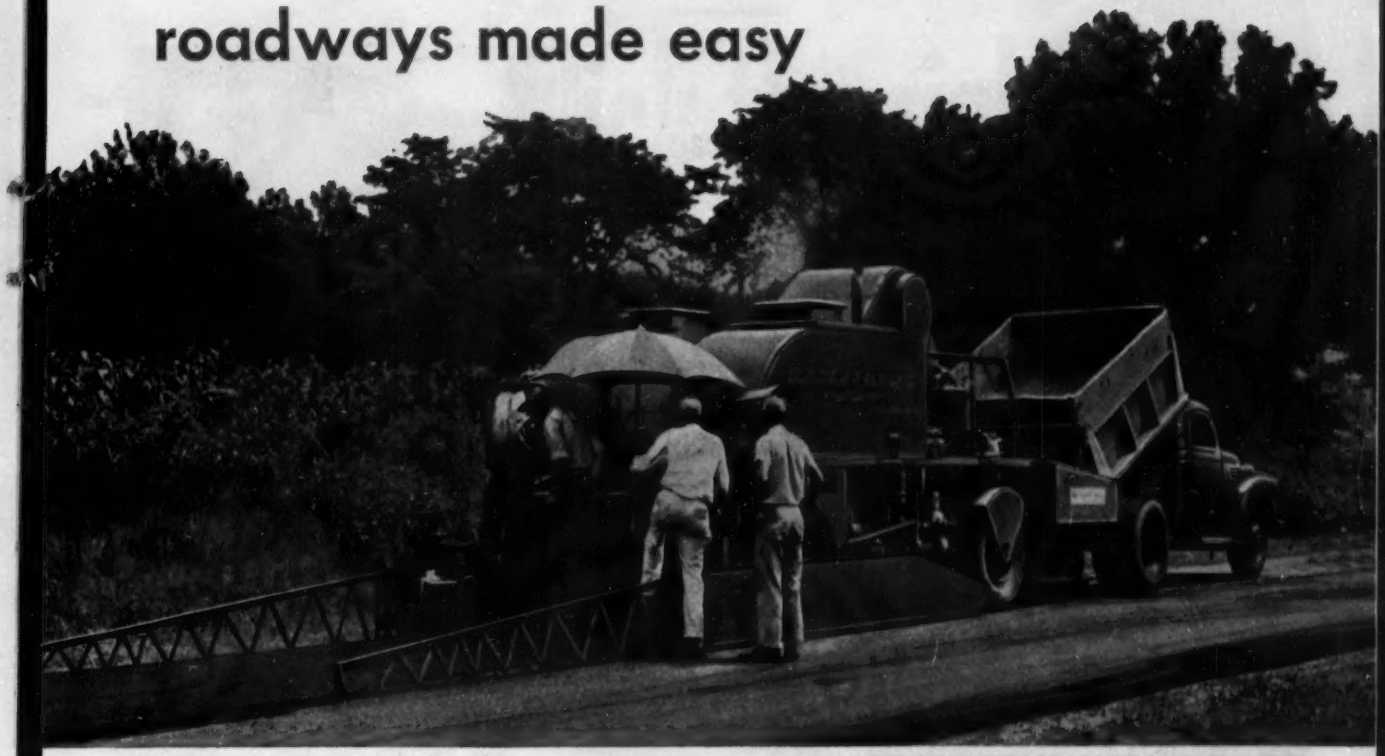


PHOTO COURTESY HETHERINGTON AND BERNER INC., INDIANAPOLIS, INDIANA

Chrysler *Power helps keep America rolling... at less cost*

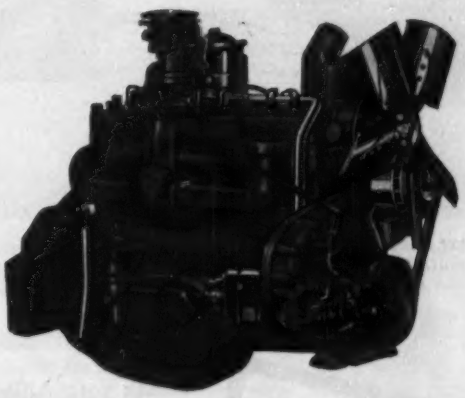
This mobile mixer-paver replaces costly man-hours with economical horsepower. In one continuous operation the unit takes in sand, gravel, stone or other road surfacing materials, mixes them in with a binder ingredient—all in predetermined proportions—and spreads the mixture onto the roadbed, to whatever depth best meets grade and crown requirements. Materials to be mixed may be fed to the unit from trucks, as in this case, or picked up from windrows with a loader attachment. The entire operation requires the services of three, possibly four, men.

The Hetherington and Berner Moto-Paver turns out up to 120 tons of mix per hour for resurfacing jobs. Paving width is adjustable from 8½ to 12 feet, depths to 7 inches. Paving speeds start at two feet per minute. Road speeds up to twenty-five miles per hour enable the equipment to carry itself from one job to another.

Two Chrysler Industrial Engines power this equipment. Travel components are driven by our Model 8 Engine whose 250 cubic inch displacement, together with Chrysler gýrol Fluid Coupling, provides power with flexibility of operation. A Model 14, powerful 331 cubic inch displacement engine, drives mixer, conveyor, spreader and pumps.

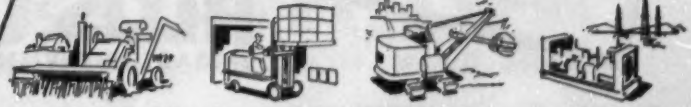
If your equipment requires power within our 230 to 413 cubic inch displacement range, engines that will operate equally well on gasoline, natural or L-P gas fuels, engines ideally suited to power take-off, see a Chrysler Industrial Engine Dealer. He can *power-fit your equipment for best performance in the field.*

Remember, too, that Chrysler Power is not expensive. Production-line methods adapted to specialized industrial engine building provide a custom-built engine at mass-production prices. If you prefer, write: ***Department 96, Industrial Engine Division, Trenton, Michigan.***



CHRYSLER *Industrial Engines*

HORSEPOWER WITH A PEDIGREE



AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELDS

(Advertisement)

a demonstration will show how you can . . .

cut costs, speed many jobs with this 2-yd. Tractor Shovel

The Tractor Shovel's value in mechanizing many phases of construction has been proved again and again by the versatile Allis-Chalmers 1-yd. HD-5G. The HD-9G, with its larger 2-yd. bucket, offers the same wide range of use with *double* the working capacity.

PREPARES RAW LAND with standard 2-yd. bucket, bulldozer blade or rock fork. Removes rocks, clears trees and brush, fills gullies, levels and rough grades. Angledozer blade also available. Rear-mounted scarifier increases efficiency in tough digging.

REDEVELOPS LAND — The HD-9G Tractor Shovel effectively clears and loads rubble from razed slum areas — makes land available for new building projects, parking areas, playgrounds.

EXCAVATES BASEMENTS. Efficiently digs, loads materials of all kinds. Shift pattern lets operator go from any forward to any reverse speed with one movement of shift lever . . . for faster loading cycles.

BACKFILLS, LEVELS, LANDSCAPES. Fills in plumbers' trenches, around sewer, gas and water pipe — transports excess dirt between houses, fills in around foundations, finish grades, builds driveways.

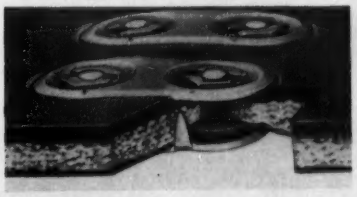
MOVES, LOADS, SPOTS MATERIALS with bucket. Also lifts, loads, skids lumber and pipe — elevates bricks, shingles to roof height. Bucket has 11 ft. 4 in. dumping height. Crane hook also available for special lifting jobs.

HD-9G — 72 drawbar hp. 29,900 lb. with standard 2-yd. hydraulic bucket.

Ask your Allis-Chalmers dealer to show how your construction jobs can be mechanized by the HD-9G, or one of the other 1- to 4-yd. Tractor Shovels — or write direct for more information.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

SCREW ANCHOR TOOL — The Pengo Screw Anchor Tool is designed to slip over the pilot of any size Pengo Auger, as used on any make of heavy-duty earth-boring machine. The eye of all leading makes of screw or swamp anchors will slip into the other end of the fitting, so any size of anchor can be screwed into the ground. Advantages claimed: it is not necessary to remove the auger, nothing to remove from the boring machine, fitting is small and light and can be placed over the pilot bit with one hand.—**Petersen Engineering Co., Santa Clara, Calif.**



BELT FASTENER—A new Flexco Belt Fastener for joining conveyor belts, called Scraper Plates, make strong, tight-butt joints. Top plates are beveled at both ends, so that the scraper will readily ride over them. They are made in one size for 5/16- to ½-in. thickness.—**Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.**

BULLY HAMMER—This 50 oz 6-in. air-powered tool has 28 different tools available for various applications. It is particularly useful in cleaning concrete-mixing equipment, star drilling, and chipping waste concrete from mixing-room floors. — **Superior Pneumatic and Manufacturing, Inc., 4758 Warner Rd., Cleveland 25, Ohio**

Pick the right jack for the job

from the world's MOST ADVANCED line of hydraulic jacks

EXAMPLE: 50-ton model GB-11 fits into cramped quarters — is one-man operated. Note short handle. Following are other big features:

LIGHTNING LIFT — 30 and 50 ton models have a patented double pump. Only ONE pump beam. No shifting of the handle. Load is quickly contacted. Then the powerful load pump cuts in automatically.

PROTECTION — No accidental lowering — release valve is recessed in the base. Pumps are concealed — not exposed to damage.

GAUGE PLUG PROVIDED — It's easy to attach a gauge to measure the load on the jack —for testing, weighing, pressing to predetermined pressures.

The MOST EXTRAS — and the MOST COMPLETE line —1½ to 100-ton capacities

Major jack users soon discover the completeness of Blackhawk's line means you can quickly get the *right* jack for the job. And their experience has proved that the most dependable, longest lasting hydraulic jacks are built by Blackhawk. What's more — after a long productive life — it's easier and less costly to replace worn parts on a Blackhawk and get it back in full action in a hurry.

There are many reasons for these long-range advantages

- Over 50 well-equipped authorized repair stations assure repair service whenever you need it.
- 68% of all replacement parts are now interchangeable among the most popular Blackhawk models
- New designs give Blackhawk Jacks *even greater* dependability

So — *standardize* on Blackhawk Jacks now. Order from leading supply houses everywhere

Get this FREE "Idea Book" See how others do cost cutting tricks with Blackhawk Jacks. Write for 64-page "Idea Book" and catalog. Blackhawk Mfg. Co., Dept. J-2364, Milwaukee 1, Wisconsin.

BLACKHAWK®

HYDRAULIC EQUIPMENT • HAND TOOLS

"We Didn't Build a Bridge, We Moved a River"...

A. S. Wikstrom, Inc.

One Sauerman Scraper helped by spreading 200 cu. yds. of muck per hour

Spreading 260,000 cu. yds. of plastic material as excavation progressed in the rechanneling of the winding Clyde River was one of the jobs done by A. S. Wikstrom, Inc. in the Thruway construction near Seneca Falls, New York.

A 6-cu. yd. Sauerman Crescent Scraper, equipped with carrier and track cable, working from a 1½-cu. yd. crane handled the job at the rate of 200 cu. yds. per hr. Length of haul was about 300 ft. An Athey Wagon served as an anchor for the track cable and provided the necessary mobility. A spud was used to support the boom and also allowed the operator to take advantage of almost the full boom height for fast gravity return of the scraper to digging point.

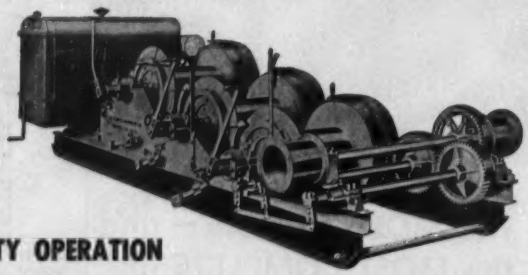
This set-up supplanted an earlier recasting arrangement using several machines. It operated at a considerable savings over previous cost.

For more details on the Clyde River project ask for Sauerman News No. 139. Request Field Report 219 and Catalog J. for specific information on the use of scrapers with boom machines. Sauerman engineers will tell you the largest Crescent scraper your dragline or tractor can handle, if you will give us the make and model number of your machine.

SAUERMAN BROS., Inc.

580 S. Clinton Street, Chicago 7, Illinois

ok HOISTS



FOR HEAVY-DUTY OPERATION

Here's a rugged and dependable hoist that will tackle your heaviest construction job, give you trouble-free operation throughout its long life . . . the OK Hoist.

OK manufactures hoists for any and all types of building construction, in single, double or triple drum styles, powered either by gasoline or electricity from 10 to 175 horse power.

ok also manufactures

- **PORTABLE ELEVATORS**
- **AIR COMPRESSORS**
  105, 160 or 210 cu. ft. of air per minute
- **HEAVY-DUTY WINCHES**

Write today for further information and specifications on these OK products.

O. K. MACHINERY DIVISION ok COLUMBIA, PA. U.S.A.

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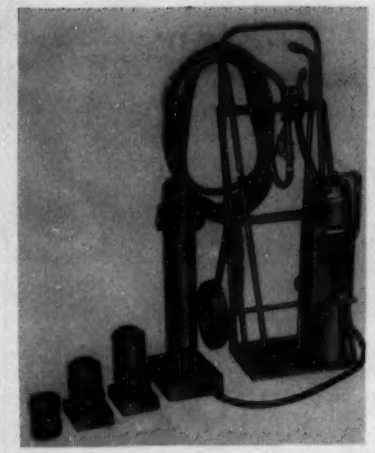
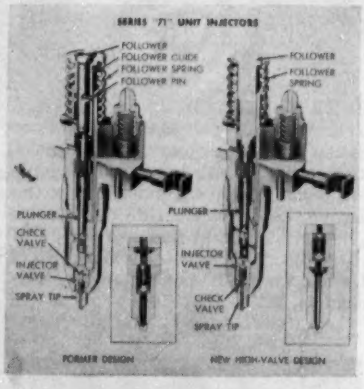
1974 Florence St., Columbia, Pa.



AIR HYDRAULIC JACK—A new type jack incorporating the use of 80 to 100 lb of compressed air to operate a separate hydraulic pump consists of a choice of four hydraulic rams, 4½, 7½, 10 and 28 in. in length which can move 30 tons in any direction a distance of 2, 3½, 6 and 20 in. The air motor is mounted on a portable buggy and comes complete with 50 ft of ½-in. air hose and 6 ft of flexible hydraulic hose. The pump, buggy and accessories weigh 150 lb. **—Duff-Norton Mfg. Co., Pittsburgh, Pa.**

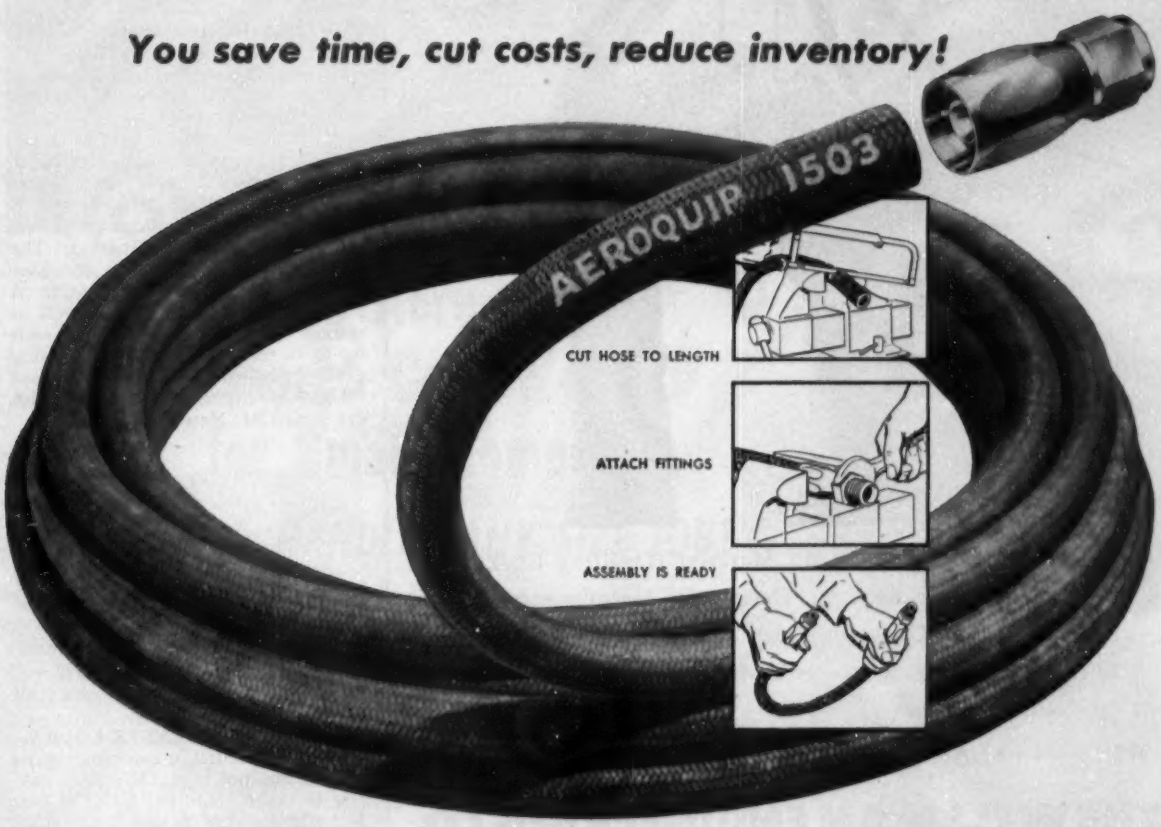


FUEL INJECTOR CHANGES—Several changes designed to give longer life and increased operating efficiency in GM unit fuel injectors in the series 71 diesel engines have been announced. In the newly designed units, the injector valve assembly has been moved to a higher position to lessen its exposure to high cylinder temperatures. The head of the new injector valve is now square rather than round. Increased protection against compression pressure and heat is provided for the valve spring through a relocation of the check valve. The number of wearing parts in the follower assembly has been reduced. Two parts kits have been developed for servicing injectors now in use.**—Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich.**

Reduce Inventory

Why stock a big assortment of ready-made hose lines when a small supply of Aeroquip bulk hose and detachable, reusable fittings answers the purpose. With Aeroquip you make hose line replacements as they are needed.

You save time, cut costs, reduce inventory!



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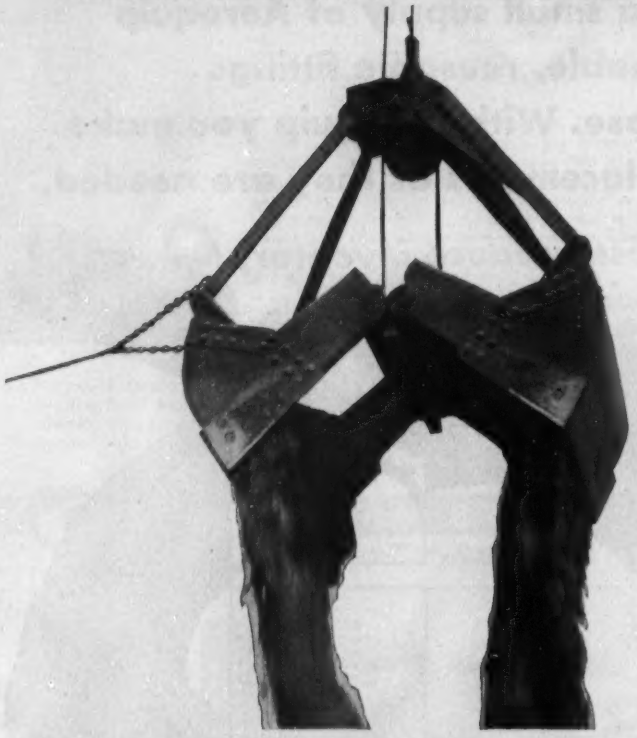
Cut your handling time with

WELLMAN-WILLIAMS
REHANDLING BUCKETS



WELLMAN-WILLIAMS Material Handling Buckets open and close faster. Their *smooth scoops* discharge the material quickly *Double hinge shaft* construction enables them to cover larger areas for bigger loads. *Extra wide scoops* cut time on cleanup operations.

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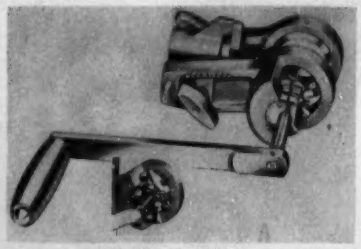
THE TIRFOR GRIPHOIST — This portable hoisting and pulling unit combines the desirable features of winches and all types of portable chain-hoisting devices. Its lightweight of only 42 lb makes it extremely portable and unlimited cable travel permits cable of any length to be used. Mechanical principle is an ingenious application of a crank, cam and lever combination. The cable passes through the machine and does not reel or spool inside. A push-pull of the handle will pull or release the cable about 2¾ in. Loads up to 10 tons can be lifted by using multiplying sheaves. It can be used in any position.—**Tirfor Griphoist, 671 Broad St., Newark 2, N. J.**



FOR BORING CYLINDER LOCKS— The new Speedril, a combination jig and boring tool, is said to enable anyone to make clean-cut holes in perfect alignment of lockset installation. It's simply clamped to a door so that the flanges of the edge hole jig rest flat against the edge of the door. The cutter for the hole, instead of being propelled by a hand-held brace, is attached to a threaded shaft mounted in a split, feeder bushing built into one arm of the jig. A winding handle attached to the other end of the bit shank gives sufficient leverage so that the bit cuts easily into the wood, taking a steady, uniform chip as it goes. A breakthrough ring in the other arm of the jig prevents splintering and insures clean-cut edges at the end of the bore.—**Lockwood Hardware Mfg. Co., Fitchburg, Mass.**

(Advertisement)

23 Acre Research Center or Site for Small Homes...

GAR WOOD HANDLES ANY SIZE JOB!

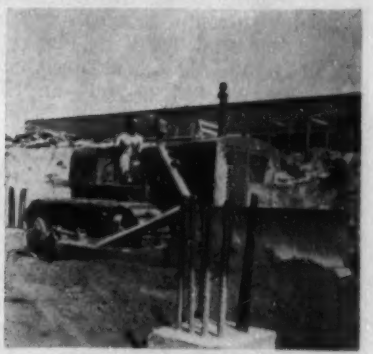
In the top photo, All-Tech Construction Co. use their Allis-Chalmers HD-15, equipped with Gar Wood hydraulic dozer, to handle approx. 50,000 yds. of excavation and land leveling for the Belmar Gardens Housing Project near Pittsburgh, Pa.

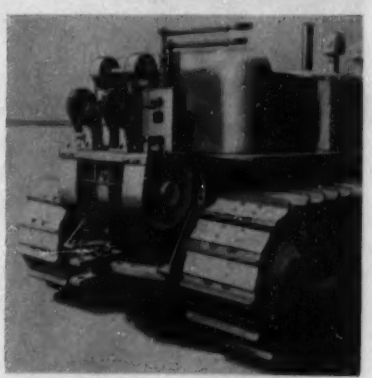
In the small photo, an HD-9, also equipped with a Gar Wood hydraulic dozer, is back-filling footing excavations for a building at the new Army Research Center near Natick, Mass. This 23 acre, $11 million project will provide complete development and evaluation facilities for over 40,000 items of Quartermaster equipment and will contain two of the world's largest personnel climatic chambers.

On the jobs of any size—in any location the tractor-dozer team is an integral part of the operation. Every Gar Wood dozer is designed, manufactured and tested to insure a perfect match with every Allis-Chalmers crawler tractor. The team gives you matched earthmoving equipment that is your answer to more work — at less cost — with more profit.

GAR WOOD CABLE CONTROL UNITS

The tractors illustrated are equipped with Gar Wood hydraulic dozers. 3 cable control units are offered for use with cable operated equipment. Shown at right is the medium-duty model 261 double-drum unit for dozer and scraper work. The heavy-duty, model 281, is similar. A single drum, front-mounted unit, model 151, is also available where only dozer operation is required. All units are of planetary design for smooth, fast and accurate control.





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GAR WOOD INDUSTRIES, INC.

TRACTOR EQUIPMENT SALES • WAYNE, MICHIGAN

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YOURS...the best deal in the entire truck field...

DODGE

Yes . . . compare the facts and figures shown at right and you'll come to this one clear conclusion . . . *Dodge trucks give you a better deal than any other leading make!* So, before you invest a single dime in a new truck, check the deal you get with Dodge! Visit your friendly Dodge dealer this week. He's ready to serve you—anytime you say.

Look at these Dodge advantages! See how Dodge gives you a better deal in every way!

Sharpest turning with new steering system, 39° turning angle! B-108 pick-up U-turns in less space than most cars!

Widest, roomiest cab of them all, with 61¾" of hiproom, 58⅜" of shoulder-room! Real 3-man size!

Best visibility with 951 sq. in. one-piece curved windshield—biggest of any truck! See *better*, see *more* with Dodge!

Deepest, most comfortable seat with 86 soft, cushioning coil springs! Chair-high (16") for easier driving!

Lowest lines with lower center of gravity for better stability, lower body floors in pick-ups and panels for easier loading!

Biggest line of sixes and eights. From 100 to 172 hp.! Assures the right power and economy for *your* job!

Most powerful high-tonnage V-8's *anywhere* . . . 153 hp. in 2¾-ton, 172 hp. in 3-, 3½-ton!

Shortest conventional tractors of any make 1½- through 3½-ton—102" from bumper to back of cab! Haul longer trailers, carry larger loads!

Lowest priced no-shift driving on low-tonnage trucks! Truck-o-matic transmission with gyrol Fluid Drive!

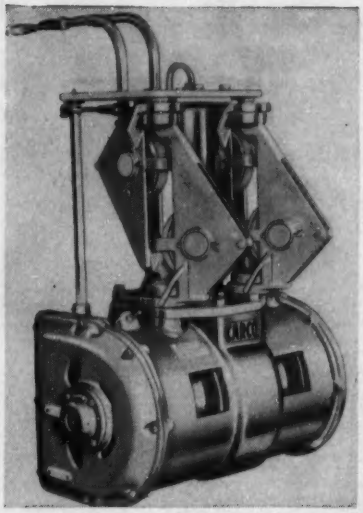
Easiest entry and exit—lowest cab floor, widest door opening saves time and effort when you're stepping in and out!

Biggest ½-ton load capacity—Dodge high-side pick-ups. *Up to 44% more* load space than other makes! Biggest ½-ton panels, too!

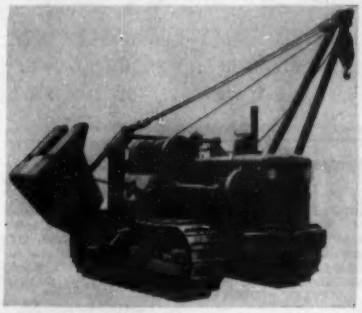
Most efficient controls—all hand controls and dispatch box are in center of instrument panel within easy reach!

See your friendly Dodge dealer now!

It all adds up to a better deal for the man at the wheel . . . with new **DODGE "Job-Rated" TRUCKS**



DOUBLE - DRUM POWER CONTROL UNIT—This heavy-duty Carco double-drum power control unit has double swivel fairleads, and is available for all makes and sizes of tractors. The simplicity of design of this unit, its strong simplified mechanisms result in accurate powerful control with a minimum of operating effort. Further information and performance characteristics may be obtained by requesting Bulletin L-203 from **Pacific Car and Foundry Co., Renton, Wash.**



NEW SIDE BOOM — A new side boom for a crawler tractor with a 38,000-lb lifting capacity at 4-ft overhang is now available for the AC HD-9F tractor. The unit introduces two major features which are claimed to be new to the side-boom field. First, is a front-mounted power take-off. This means the power is taken from a live shaft so that the side boom works independently of the tractor master clutch. Second, is the twin clutch arrangement on the power takeoff. This arrangement consists of two multiple plate Twin Disc clutches, one for raising and one for lowering. The 6,500-lb counterweights can be extended or retracted hydraulically. The boom is a box-beam section, 15 ft long which pivots on replaceable hardened pins and bushings. Total width with outer frame members removed is 8 ft 2 in. —**Tractomotive Corp., Deerfield, Ill.**

Attention Riggers!

Here's a complete line of dependable jacks for every lifting, lowering, or pushing job

5 TONS	10 TONS	15 TONS	20 TONS
(No. 516 MT)	(No. 1022)	(No. 1522)	(No. 2028)

Every Duff-Norton Ratchet Jack is guaranteed at full capacity for loads applied to either head or foot lift!

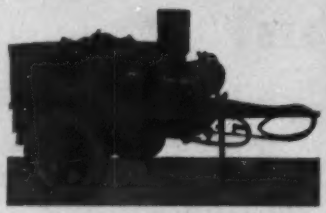
Regardless of the job at hand, whether it's skidding a heavy piece of machinery, repairing an earth-moving machine, tractor, truck, bulldozer, lowering equipment and materials, there's a precision-made Duff-Norton ratchet jack of the correct size to do your job faster, easier and with less effort.

Duff-Norton ratchet jacks are designed and built to give long and trouble-free service with a minimum of maintenance.

See your distributor regarding detailed specifications on any of these jacks or write for your free copy of a new 40-page Jack Manual, Catalog No. 204-T listing the complete line. Write to the world's oldest and largest manufacturer of lifting jacks, the Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

DUFF-NORTON

Jacks



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The "Canton"
CAR TRANSFER

Loads Entire Train on Single Track

Out going dirt—incoming liner concrete, no alterations to track, with the "Canton" Car Transfer. Less rib to shoot, than for jump switch. Less hazardous than cherry picker. Car always on wheels.

You make spectacular savings with full speed ahead at the loader. Used by mines and big tunnel operators everywhere. *Self Liquidating, short time.*

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POWER HOIST—The Hoist-Master Swinging Hi-Boom, which reaches up in the air 25 ft, comes in four sections. It can be assembled easily and quickly. Four swivel wheels with brake and swivel-lock allow easy and convenient moving on horizontal runways beside scaffold, etc. Full information and details may be had by writing **Smith Hoist Mfg. Co., Inc., Cassopolis 11, Mich.**

LAG SCREW SHIELDS—A new line of lag screw shields claimed to simplify and speed the setting of cut- or rolled-thread lag screws has just been introduced. Called Hi "Super-Cast" Shields, they are made in four sizes, ¼ to ½ in.—short and long. They are manufactured in special rust-resisting alloy, giving a high-tensile and compressive strength. — **Holub Industries, Inc., Sycamore, Ill.**

NEW TYPE CRUSHER — A new principle for crushing rock is embodied in the Latture Roto-Crusher. The heart of the crusher is a pair of rotors, one concave and the other convex, each of which is corrugated axially, the corrugations being constantly spaced around the entire peripheral surface. These rotors move in opposite directions, are independently driven and are accurately timed, so the corrugations are in constant mesh. Spacing between the rotors can be maintained, as desired, from ⅜ to 6 in., through the use of a hydraulic system. The crusher is said to produce ¾-in. minus material at the rate of 140 tons per hr, with a reduction of 4 to 1.—**Waldrip Engineering Co., Hollydale, Calif.**

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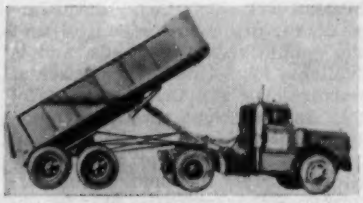
● We offer for your consideration a winch operated dump trailer that is capable of handling larger loads cheaper and faster than anything on the market today.



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With FORMULA NO. 640, a clear liquid which penetrates 1" plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt. Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. $3 in 55's. Free sample. See Sweet's.
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New Advertisements

received by June 22nd will appear in the July issue subject to limitations of space.

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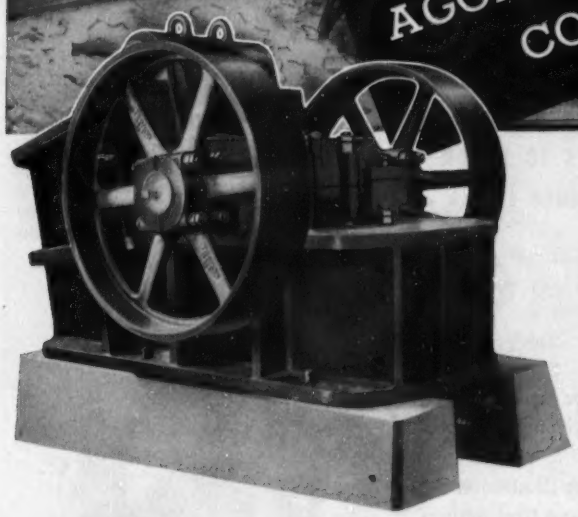

A Traylor Jaw Crusher on the job site puts you in complete control of your aggregate supply. You control the source . . . the delivery . . . the quality . . . *and the cost* of job-produced aggregate. Original Traylor features . . . curved jaw plates . . . heavy-duty construction . . . more efficient application of power . . .add up to greatly reduced operating costs for longer periods of maintenance-free operation. Get full information on a Jaw Crusher "Traylor-Made" to control your aggregate costs.
Mail coupon for illustrated bulletin.

Traylor

TYPE H AND HB JAW CRUSHERS

TRAYLOR ENGINEERING & MANUFACTURING CO.
657 MILL ST., ALLENTOWN, PA.

Tell me how I can control my costs on job-produced aggregate. Send me Bulletin 4105.

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*Company*_____

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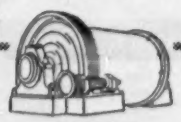
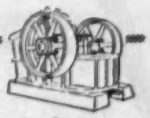
West Coast Branch: 607 Sharon Bldg., 55 New Montgomery St., San Francisco 5, Calif.
Northwest Distributor: Balzer Machinery Co., 2136 Southeast 6th Ave., Portland, Ore.

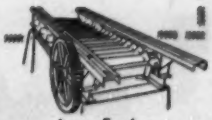
Primary Gyratory Crushers

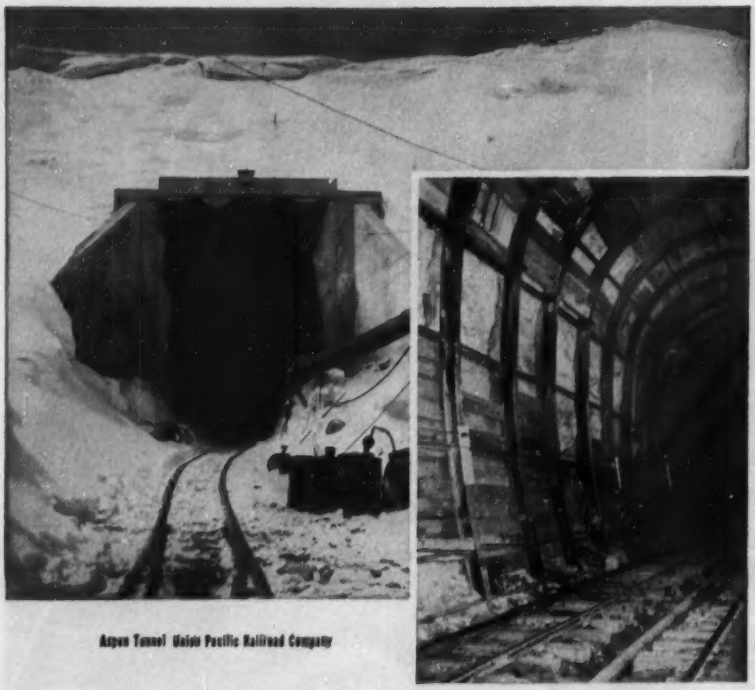
Rotary Kilns

Secondary Gyratory Crushers


Ball Mills


Jaw Crushers


Apron Feeders



Aspen Tunnel Union Pacific Railroad Company

You should erect "COMMERCIAL" Steel Timbers to speed completion of your tunnel construction and reduce cost . .

Several years ago a tunnel in the West was being driven through shifting ground. 12 by 12 wooden timbers placed skin tight were found inadequate to support the tremendous loads which developed. As one tunnel foreman so aptly said, "They are cracking like matches."

"Commercial" tunnel engineers were called in to design and build a steel tunnel support that would carry the load, thus enabling the tunnel to be completed, rather than abandoned.

Since those days "Commercial" steel tunnel supports have been used in many large tunnels. In fact there are so many advantages in steel timbers that today wooden timbers are rarely even considered. Steel tunnel supports can be designed to meet the load requirement. They are tailored to fit the job and completely shop fabricated. Erection by unskilled men can be made much faster. Fire hazards are vastly reduced and all workmen are given greater protection.

Notice in the above illustration the conformity of the curved steel timbers and how closely the excavation has been held to the neat concrete line. Savings due to reduced excavation yardage is very substantial.

In driving your next tunnel, let "Commercial" steel tunnel supports carry your load more safely and at lower cost.

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"COMMERCIAL"

"PRODUCTS PREFERRED BY CUSTOMER ACCEPTANCE"

"Commercial" engineers will gladly assist you; they have the experience and know how.

LINER PLATES · RIBS · SETS · LAGGING

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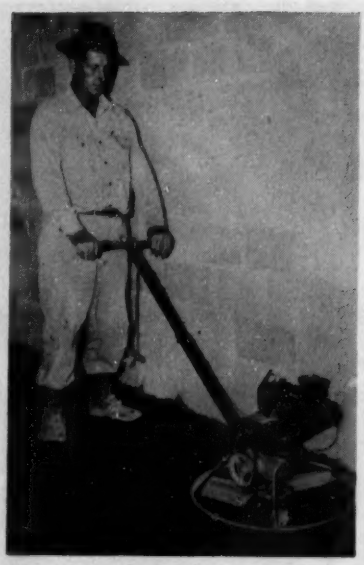


24-IN. TROWEL—Claimed to do the work of 6 hand finishers, this 24-in. Master Midget power trowel is the newest addition to the Master Vibrator Co. line of power trowels. It weighs less than 70 lb and is powered by a 1.6 hp Briggs & Stratton engine. It has three steel blades, with positive snap-in adjustments for floating, sweat, smooth or hard trowel finishes. — **Master Vibrator Co., 461 Stanley Ave., Dayton 1, Ohio**

ELECTRIC GENERATORS — New model B-2000 Lynnco Powerhouse, hand-portable, engine-driven, electric generator offers more power in less space at lower cost with greater versatility than conventional units in its power range, according to the manufacturer. The unit will provide both electrical and mechanical power simultaneously without removing either the generator or engine from the steel base. It has a maximum output of 2,500 watts, continuous rating of 2,000 watts, 115 v, single phase, 60 cycles. Weight is 145 lb, and over-all dimensions are only 17x23x19½ in. high. Power is supplied by 5-hp Briggs & Stratton 4-cycle air-cooled engine.—**Lynn Engineering & Supply Co., Russ Bldg., San Francisco 4, Calif.**

Why do contractors *prefer* PAYLOADER® TRACTOR SHOVELS?

compare these two items

ORDINARY TRACTOR SHOVEL

¾ Yd. [redacted] tractor shovel, nearly new, used only 4 mo's. Will sacrifice for half price. Phone [redacted]

as appl[illegible] the auction among

PAYLOADER TRACTOR SHOVEL

Top price at the Auction Sale among used tractor shovels was for a HOUGH Model HF "PAYLOADER", 2½ years old, which brought 68% of its original price. The unusually high price came as a complete surprise to even the auction officials.

Wise tractor-shovel buyers know there's more value in a "PAYLOADER" when it's new and that it'll bring more when they sell it. They know that The Frank G. Hough Co. has pioneered MORE developments and MORE improvements in tractor-shovels than all other manufacturers put together.

Further proof of "PAYLOADER" value is evidenced by the fact that you will seldom find a *used* one for sale — even though more "PAYLOADER" machines have been built than all other makes of unit-design tractor-shovels combined.

So, when you want maximum value and PROVEN PERFORMANCE in a tractor-shovel, you'll be wise to buy a "PAYLOADER". A complete range of sizes and models from 12 cu. ft. to 2 cu. yd. bucket capacity. Your nearby "PAYLOADER" Distributor is ready to serve you. The Frank G. Hough Co., 706 Sunnyside Ave., Libertyville, Illinois.

This is a Model HF "PAYLOADER" tractor-shovel like the one that brought top price in the Auction Sale quoted above.

You can't compete if your equipment is obsolete.

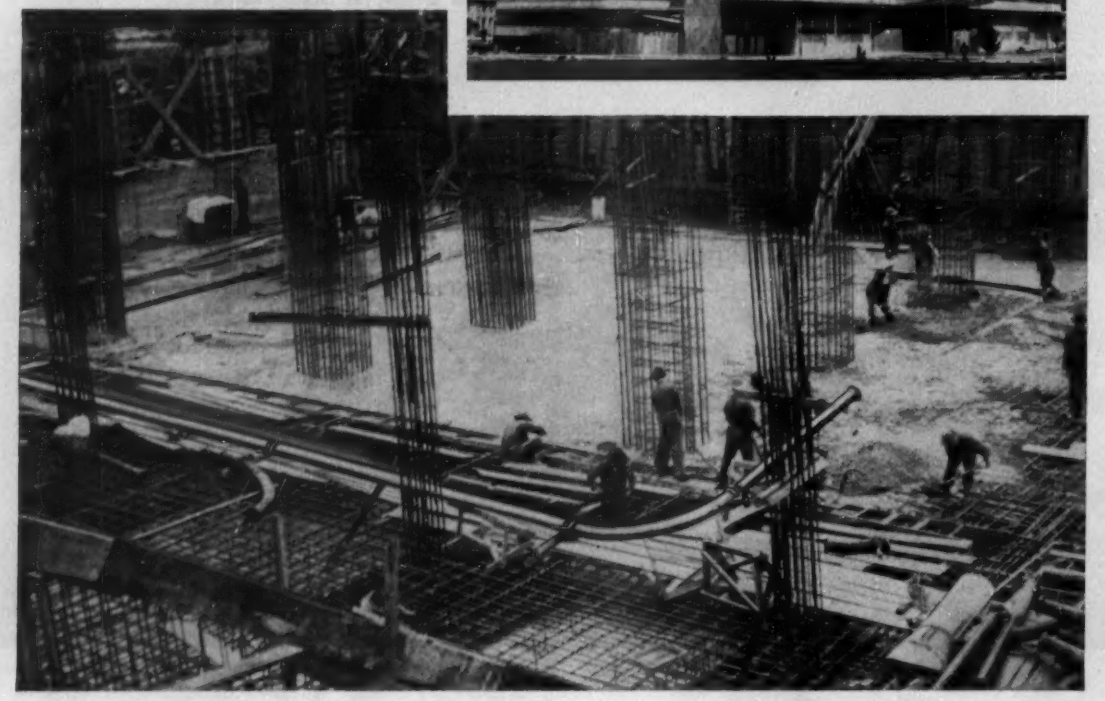
PAYLOADER®

Pan American Airways Builds Bogota Hotel...

Recently opened Hotel Tequendaura in Colombia's capital city of Bogota is the newest of Pan Am's chain of Latin American hotels. It's managed by their hotel-operating subsidiary, International Hotel Corp.

Designed by Chicago Architect...

Holabird, Root and Burgee of Chicago, internationally known architects, designed this impressive 17-story hotel.



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says Bogota Contractor, Cuellar, Gomez and Cia., Ltd.

Rex Pumpcrete was used to place all the concrete for the structure... 14,400 cubic yards for foundations, supporting beams, columns and floors for this seventeen-story, $7,500,000 hotel, one of the most modern in Latin America. Two Model 160 Pumpcretes were used, sharing the pumping job for the first 10 floors... a height of 110 feet.

From the tenth floor on, one Pumpcrete was moved up to the 10th floor and the unit on the street level pumped into the hopper of the elevated Pumpcrete. This tandem pumping was very satisfactory, and the remaining 7 floors were pumped in this manner to an over-all height of 205 ft.

One floor was completed every five days.

Said Georges Sokolow, chief engineer, "Pumpcrete worked perfectly and gave every satisfaction."

Why not investigate the job-speeding, cost-cutting possibilities of Pumpcrete for your next job. See your local Rex Distributor or write Chain Belt Company, 4664 W. Greenfield Ave., Milwaukee 1, Wis.

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CONSTRUCTION MACHINERY

MOTO-MIXERS® MIXERS PUMPS PUMPCRETES® PAVERS

CRANE CARRIER—Schield Bantam has announced an all-new, specially designed Crane Carrier to its line of factory furnished trucks available for mounting of the T-35. It features a 12-in. I-beam frame, 26,000 lb rated rear axle and large tires. It has a turning radius of 16½ ft. The wheelbase is 148 in., 4-wheel drive; 10 wheels; Hercules JXC 6-cyl engine; 5-speed transmission with dual range giving up to 10 speeds forward and 2 in reverse. It is 236 in. over all, 96 in. wide and height is only 8 ft, 18⅜ in. — **Schield Bantam Co., Waverly, Iowa**

CONCRETE COMPUTER FREE—If you are a contractor, you can get this concrete volume computer free. All that is needed is the dimensions of the slab or wall to be poured, move the slide rule to correspond with these dimensions and the volume of concrete needed shows up on the scale.—**Stow Mfg. Co., 443 State St., Binghamton, N. Y.**

LUG-ALL WINCH-HOIST — This husky 8¾-lb Lug-All Winch-Hoist is now available in a new marine model for use under conditions where rust and corrosion shorten the life of hoists. It has a 133-strand stainless steel, pre-formed aircraft cable. The frame is aluminum alloy with all aluminum parts anodized. It will lift or lower 1½ tons. Cost is $44.—**Lug-All Co., Wynnewood, Pa.**

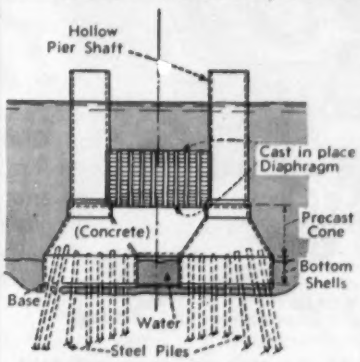
PHOTO BY E.N.R.

PRECASTING 90-TON SHELLS to be used as part of concrete piers for Richmond-San Rafael bridge requires thorough vibration to produce dense, high strength concrete, accurate finished surfaces, and prevent voids inside the sloping forms. Windows aid concrete placement.

Vibration makes strong, accurate precast shells for bridge piers

Precast reinforced concrete shells assembled underwater and filled with tremie concrete will provide 53 of 62 deep water bell bottom piers for the Richmond-San Rafael bridge on San Francisco Bay. Joint venture contractors Ben C. Gerwick, Inc. and Peter Kiewit Sons Co. developed the technique in preference to using steel shells that cannot be recovered. State engineers estimate that the design saves about $1 million over conventional methods investigated.

Reusable steel forms and careful placement and vibration produced uniform close tolerance surfaces and dense concrete free of voids on this job. These are just as important in other modern concrete techniques such as precast and prestressed girders, pressure pipe, and architectural work.



ASSEMBLED PIER consists of a base, a cylindrical bottom shell 9 feet high, the truncated cone section (cast in pairs, connected by a rectangular diaphragm) and a hollow cylindrical shaft, all precast. Entire structure is filled in place with tremie concrete.

• **Thorough vibration** is an essential part of the careful casting technique needed to produce the strength and accuracy required by the job. The shells, which vary from 14 to 34 feet in diameter, are cast in a yard about twenty miles from the bridge site, barged to the site and handled by a floating derrick. Vibration with VIBER high speed internal vibrators gives dense concrete, well bonded to reinforcing steel. This makes the shells salt water resistant to minimize steel corrosion and strong enough to be handled by lifting.

Accuracy of finished surfaces on the shells is doubly important. True surfaces make assembly underwater much easier. Good fitting joints also keep to a minimum loss of tremie concrete when the shell is filled after it has been assembled in place.

• For complete details on this interesting job refer to Engineering News-Record, March 4, 1954, and Construction Methods and Equipment, December 1953, March, April 1954. For information on the complete VIBER line of external and rubber tipped internal vibrators contact your authorized distributor, or VIBER COMPANY, 726 South Flower St., Burbank, California.

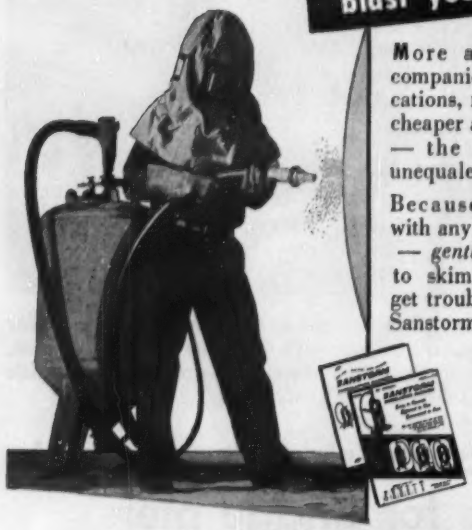
VIBER

Dept. 68

CONCRETE VIBRATORS SINCE 1931

SANSTORM IT!

blast your cleaning costs



More and more construction companies are cleaning steel fabrications, masonry, forms, equipment cheaper and quicker with Sanstorms — the sandblasting machines unequaled for low cost service.

Because Sanstorms are non-plug with any abrasive the job requires — *gentle* to smooth off or *tough* to skim off heavy scale — you get trouble-free performance with a Sanstorm.

Write today for **FREE** literature. Add any questions about your cleaning problems for Sanstorm recommendations without cost or obligation.

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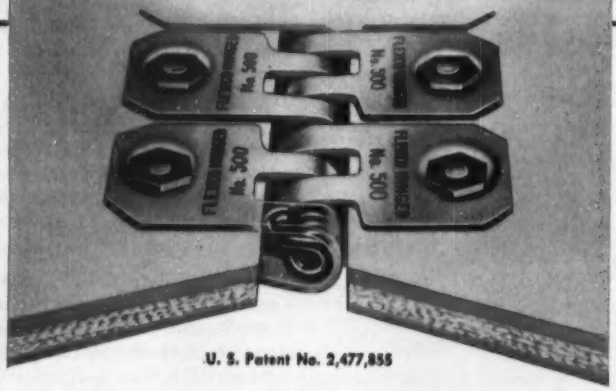
MANUFACTURING COMPANY
P. O. BOX 1173-9, FRESNO, CALIFORNIA

... the new separable

FLEXCO HINGED
BELT FASTENERS



U. S. Patent No. 2,477,855

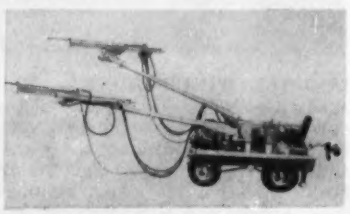
- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts 3/16" to 1/2" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.

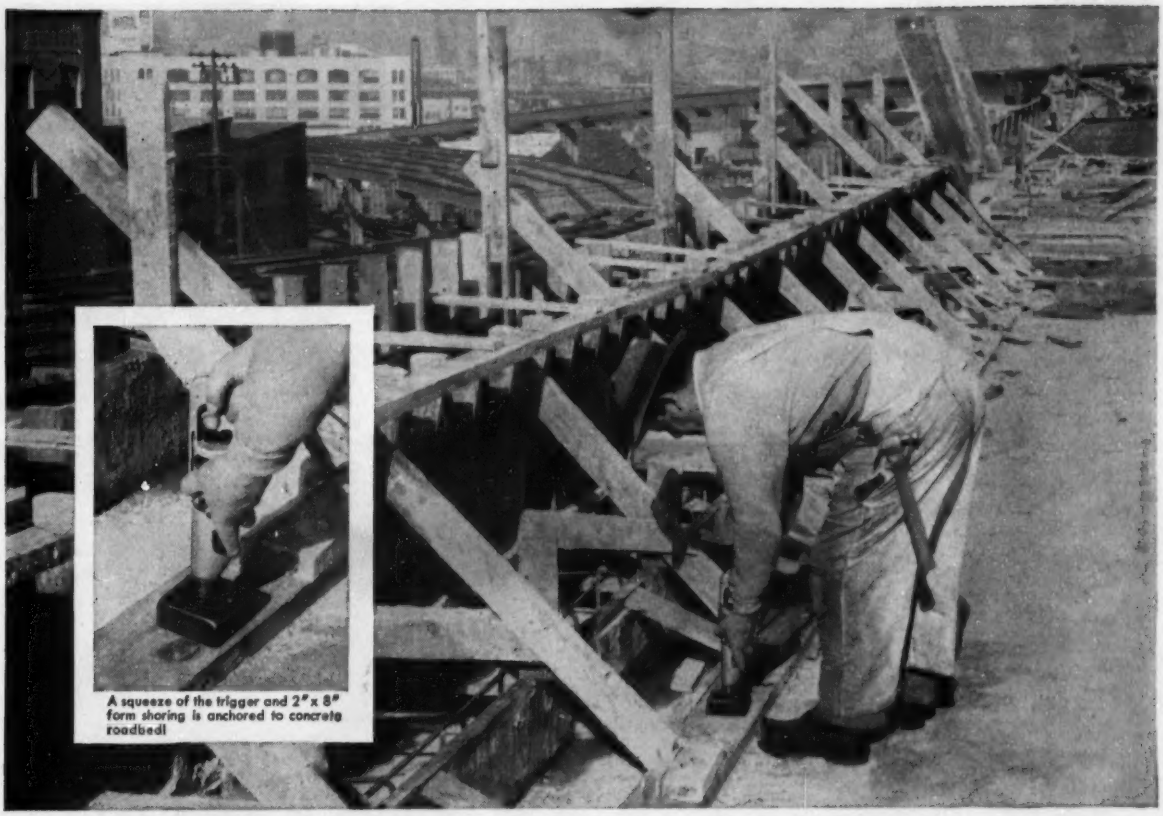
TO REMOVE PAINT FROM WALLS—A new cutter-head developed for use with a Stow flexible shaft machine for removing paint from brick walls is said to do the work of four to six men in comparison with former methods. The cutter-head is precision built and is so well balanced that it can operate at high speeds without excessive chatter. It can be obtained from the **Industrial Supply Co., Richmond, Va.**

TRUCK STAIR—The Tacco Truck Stair has been developed to make the chores of a driver safer and easier. It is self-retracting and folds back automatically upon contact. To unlock the stair for use, it is necessary only to trip the tempered spring steel snap latch, pull out the stair and it drops into place. It attaches to the truck bed or cross-frame by 4 bolts, or it may be welded in place, if desired. It weighs 50 lb, is 14 in. wide, 34 in. long and 8 in. high. Steps are 6 in. wide.—**E. D. Bullard Co., 275 Eight St., San Francisco 3, Calif.**



MOBILJUMBO WITH REMOTE CONTROLS—One operator can move into position with the new Gardner-

(Continued on page 201)



A squeeze of the trigger and 2" x 8" form shoring is anchored to concrete roadbed!

REMINGTON STUD DRIVER speeds fastening job on West Coast Highway

TEMPORARY ANCHORING OF FORMS TO CONCRETE can be time-consuming and costly—but it wasn't that way on the new San Francisco Freeway. Here, the Remington Stud Driver did the job in record time by setting up to 5 fastening studs per minute!

The forms were used for pouring the Freeway's railings and curbings after the concrete roadbed had set. A workman simply moved down the base strip with the Stud Driver, and it was securely fastened! When the curbing was in, the forms were removed and the studs broken off below the concrete surface. The small craters that remained were smoothed over with grout.

SAVINGS UP TO 80% IN FASTENING COSTS ARE NOT UNCOMMON with the Remington Stud Driver. Its speed, light weight (6 lbs.), and freedom from wires and hose make it ideal for all kinds of construction fastening. Find out how *you* can save with this powder-actuated tool by mailing the coupon below.

"If It's Remington—It's Right!"

Remington DUPONT

Listed & Approved by Underwriters' Laboratories, Inc.

QUESTIONS YOU ARE ASKING

QUESTION: What caliber cartridge powers the Stud Driver?

ANSWER: 32 caliber power loads are available in six grades, each designed for your specific fastening requirements.

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. C.M.E.-6
Remington Arms Company, Inc.
Bridgeport 2, Connecticut

Please send me a *free* copy of the new booklet showing how I can cut my fastening costs.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

The pioneer still leads

in 6-wheel sales for 18th straight year!

New INTERNATIONAL RF-190 Series. Proved INTERNATIONAL bogie with third differential. GVW ratings, 30,000 to 38,000 lbs. 145, 157, 175, 193, and 211-inch wheelbases. Gasoline, LPG, or diesel power.

Eighteen years ago, the first 6-wheel INTERNATIONALS were built. With them, heavy-industry and off-highway truck operators could haul bigger payloads.

Every year since, INTERNATIONAL has been sales leader in the 6-wheel field. This leadership was won, *and still holds* because of respected INTERNATIONAL quality. Another important reason: owners' records prove INTERNATIONAL 6-wheel trucks keep operating and maintenance costs at a minimum.

You can choose the truck that's *exactly* right for your operation—because INTERNATIONAL builds America's most complete 6-wheel line.

Talk to your INTERNATIONAL Dealer about the right 6-wheel truck to cut *your* operating costs. Time payments arranged.

AMERICA'S MOST COMPLETE 6-WHEEL LINE —23 MODELS

GVW ratings, 22,000 to 90,000 lbs. Engines from 130 to 356 hp. Choice of gasoline or LPG power. Diesel engines available in models with GVW ratings of 30,000 lbs. and over. Transmissions and axle ratios to meet any requirements. America's most complete truck line—170 basic models, from ½-ton pickups to 90,000 lbs. GVW off-highway models.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

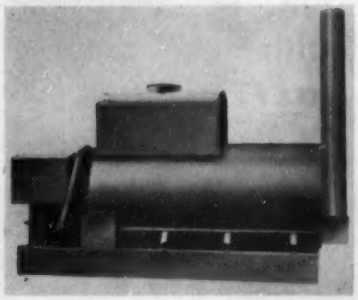
Better roads mean a better America

INTERNATIONAL® TRUCKS

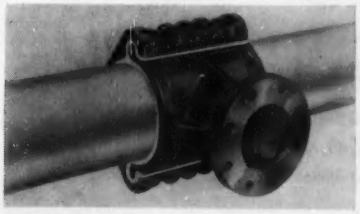
"Standard of the Highway"

(Continued from page 198)

Denver JSP Mobiljumbo and drill out a complete round in drift, tunnel, room, quarry or rock cut, without leaving his seat on the jumbo carriage. Positioning of the booms and drills, the complete drilling cycle, is handled by hydraulic controls grouped in front of the operator. Various boom lengths are available for efficient drilling of faces up to 14 ft high. Face widths of 25 ft can be drilled from a single setting of the unit. — **Gardner-Denver Co., Quincy, Ill.**



HEATER—Here's a new heater for asphalt storage, heating jacketed lines, pugmill and asphalt for hot-mix plants. It burns either gas or oil, is skid-mounted and electrically operated. Heating is accomplished by circulating heated oil through coils in the storage tanks and through jackets in various asphalt lines and pugmill. It comes in two sizes.—**W. E. Grace Mfg. Co., 6100 S. Lamar St., Dallas, Tex.**



TAPPING SLEEVE FOR PIPE — A boltless tapping sleeve for cement-asbestos pipe is designed to eliminate the parts generally affected by corrosion and constructed of high quality grey-cast iron, is claimed to outlast the pipe on which it is installed. Elimination of the usual calking process and the simplicity of installation make it possible for unskilled workmen to make a new installation or a tapping sleeve replacement in a few minutes. Water tested in excess of 1,700 lb PSI, the new sleeve offers complete leak-proof performance.—**Corey Mfg. Co., Dept. 3, Los Angeles 65, Calif.**

COMING . . . in July

Equipment-Maintenance Directory

Tough Digging in Close Quarters

IN PORTLAND, MAINE, the soil in many places can be downright troublesome, with large stones and boulders mixed in with smaller stones and gravel, a combination that makes tough digging. Add to this the fact that trench lines in many places run right alongside rows of trees, poles and other obstructions and you've got a really mean job of trenching.

Yet this CLEVELAND Model 95 "Baby Digger" is moving right along on the job—as shown by the discharge from the conveyor—coming through with the same dependable performance that has made it an outstanding favorite for over 30 years.

This is the kind of job where CLEVELAND'S famous multi-speed transmission really pays off, enabling the operator to select the *right* combination of power and speed for the particular job condition from more than 30 available combinations of digging wheel and crawler speeds.

The "Baby Digger's" compactness and maneuverability also played important parts in completing this job right on schedule in spite of numerous obstructions. The large boulders deposited to the left of the trench in the photo show that good use was also made of CLEVELAND'S reversible conveyor on this job.

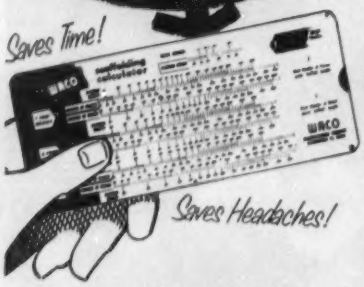
Write for descriptive bulletins and specifications, or get the full story on CLEVELANDS from your local distributor.

THE CLEVELAND TRENCHER CO.

"Pioneer of the Modern Trencher"

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

FREE!
WACO
scaffolding
calculator



tells you the scaffolding you need for every job.

Tells you in seconds the number of frames and cross braces you need for most jobs. Saves you hours of "desk work." Helps you figure each job closer. Get yours now. FREE! Write today!

WACO *the world's fastest scaffolding*
CUTS YOUR COSTS THESE 4 WAYS

SPEEDLOCK saves erection time. Locks cross braces instantly and with complete safety. Nothing to lose, slip or come off.

FLOATING COUPLING PIN lets men set frame one leg at a time. Saves time.

WACO MASON'S ACCESSORIES —T-Jacks, Block Lifts, Mortar Board Stands, Scaffold Brackets, Waco "Speedset" All-Steel Shores.

RENTAL SERVICE—Stock the units you need *most* of the time . . . rent special equipment as needed from your Waco Distributor.

Write for his name and address

WACO
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3560 WOODALE AVE.
MINNEAPOLIS 16, MINNESOTA
Licensees: Waco-May Co., Los Angeles, Calif. Armson Iron Works, Windsor, Ontario
A few good Waco Distributorships available. Write.

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

BELTING—Boston belting products are pictured in color and tabulated as to specifications, type of construction and recommended uses in a newly issued 28-p catalog on transmission, conveyor and elevator belting. Write on your company stationery to the **Boston Woven Hose & Rubber Co., Box 1071, Boston 3, Mass.**

STRAIT-LINE LOADER—A picture story of the Strait-Line 88 Loader, with specifications, is contained in an indexed catalog just released by **Maine Steel, Inc., South Portland, Me.**

BETTER CONCRETE FASTER—Concise and detailed facts on how the addition of calcium chloride to the mix results in better, faster and more economical concrete construction are contained in a pocket-size, 10-p illustrated booklet released by the **Inorganic Sales Dept., The Dow Chemical Co., Midland, Mich.**

TRUCK MIXER—Just off the press is a new 12-p bulletin giving the features of the Transcrete Truck Mixer. The mixer is available in 3½-, 4½-, 5½-yd sizes with permissible ½-yd added rating. Write for bulletin TM1054, **Construction Machinery Co., Waterloo, Iowa.**

ROAD JOINT DEVICES—Information covering the full range of road joint devices for concrete highways and airstrips is presented in a single bulletin now being issued by the **Richmond Screw Anchor Co., Inc., 830 Liberty Ave., Brooklyn 8, N. Y.** A postcard addressed to the manufacturer will get you this bulletin and prices.

MATERIAL HANDLER—Cutting the costs of handling construction materials is the theme of a new brochure describing how Prime-Mover power wheelbarrows are used to haul all kinds of construction materials on a variety of projects. For free copies write **The Prime-Mover Co., Muscatine, Iowa.**

JACKS—Publication of a new 2-p, two-color catalog sheet on Waco Mason's T Jacks has been announced by **Waco Manufacturing Co., 3565 Wooddale Ave., Minneapolis 16, Minn.**, manufacturers of sectional steel scaffolding and shoring equipment. The sheet describes the jacks' adaptability to uneven ground levels, fast and easy erection, sturdiness and light weight.

PREVENT DELAYS ON-THE-JOB

with fast, sure GILSON Screen Testing

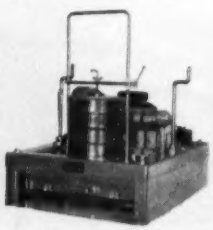
Failure to meet sizing specifications costs time and money.

The GILSON Mechanical Testing Screen cuts out error and guesswork in meeting sizing specifications for crushed stone, gravel, slag, coal, ores, and similar materials.

A GILSON Test Report is the standard of industry. It is your guarantee that every carload, every truck-load is as-ordered.

And GILSON does the job *fast*—five minutes or less per complete test.

A Sand Attachment for handling 8-inch sieves is optional equipment.



HERE'S WHY YOU WANT GILSON—

No more guesswork on sizing
No more tedious screening by hand

1. Makes tests quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

Write now for additional information

GILSON SCREEN CO.
MALINTA, OHIO

The HELTZEL TYPE-TWO PLANT

BIG PRODUCTION *Where You Want It!*

This is no "Fancy Dan" piece of equipment. It's a big 200-ton capacity husky that can be quickly erected and dismantled, moved from job to job in large, easy-to-handle sections.

It's fast and accurate . . . no holdups or fouled batches. It's the big, versatile, hard-working plant designed to keep pace with modern concrete construction. It takes any type batcher, including the new Heltzel Automatic Push Button.

If you're in the market for big, high-production, portable equipment, check this **Heltzel Type-Two Plant** before you buy. It's available in the cement-aggregate design, or for aggregates alone. There are batchers, cement plants, elevators, conveyers—everything you'll need, designed to work with it.

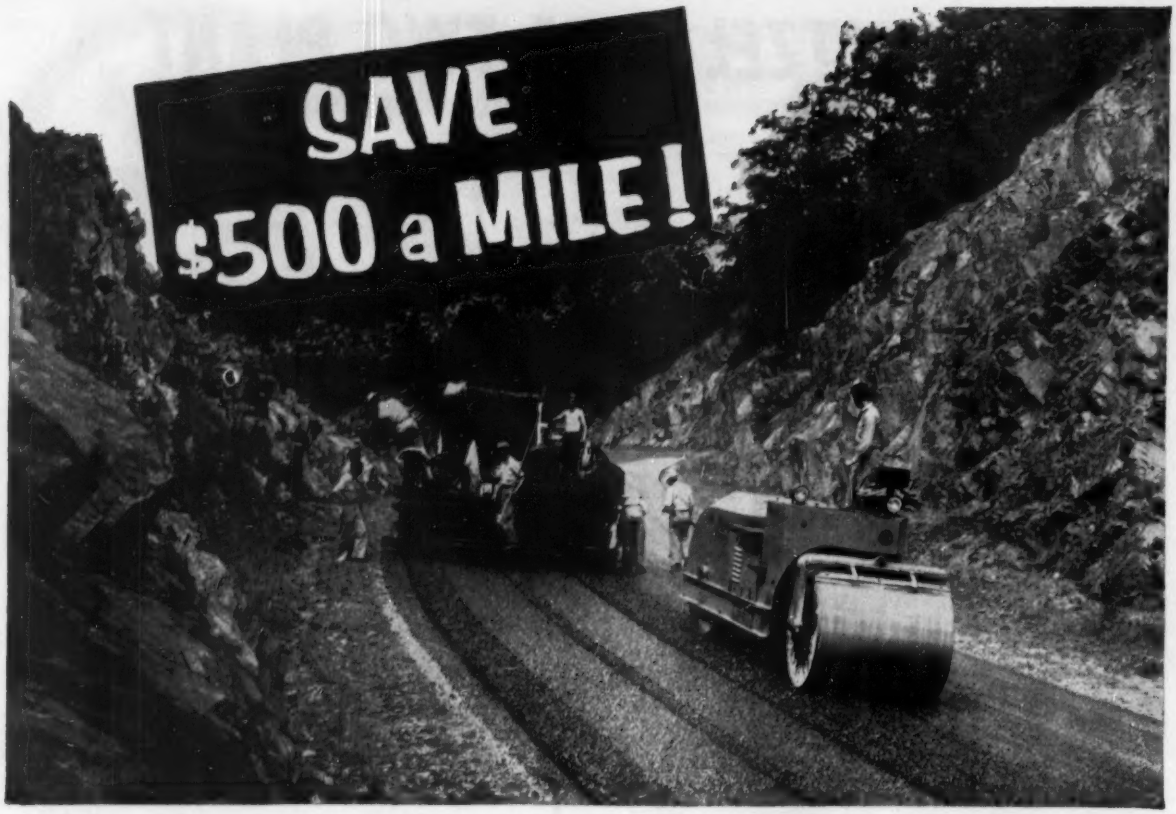
THE HELTZEL STEEL FORM and IRON CO.
6200 THOMAS ROAD
WARREN
OHIO

Please send latest Batching Plant literature to:

Name_____

Company_____

City_____ State_____



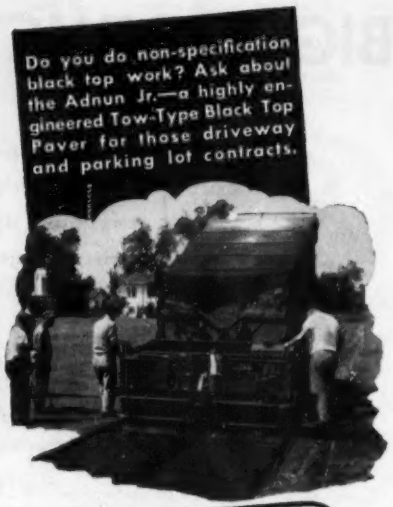
UPWARDS to $500.00 a mile could be the savings you make with the Adnun Black Top Paver, equipped with the Adnun Fluid Level. With the Adnun you can figure right on the "button" and eliminate the excess you pour into a road to be certain of meeting grade line specifications.

If you saved only half that amount, it would be worth it!

The Adnun Black Top Paver is the only paver that can include the Fluid Level along with many other advantages. With the Adnun Fluid Level you have an absolute check on your grade all of the time. The center of the road will be as true as the edge. You take out the dips that won't show under a straight edge.

Overlapping action of the Cutter Bar Screed makes a tight joint and reduces raking. Sturdy construction eliminates the rebuilding so often necessary with other machines. Modern electric screed heating gives better heat, free from danger and the many other advantages combine to assure a fast job at lower cost.

Don't be swayed by preconceived opinions. You owe it to yourself to find out about this and other Adnun advantages. Let us tell you more about it.


Do you do non-specification black top work? Ask about the Adnun Jr.—a highly engineered Tow-Type Black Top Paver for those driveway and parking lot contracts.

ADNUN
BLACK TOP PAVER

BLAW-KNOX COMPANY
FOOTE CONSTRUCTION EQUIPMENT DIVISION
191- State Street
Nunda, New York

BLAW-KNOX

CHARGE-A-PAVER—Described in a 4-p booklet is the Lorain TL-25 "Charge-a-Paver," an attachment which may be used on the standard crawler-mounted TL turntable. It explains how concrete highway paving costs can be lowered and paver output increased by using this attachment.—**Thew Shovel Co., Lorain, Ohio.**

AUSTIN OVERSHOT—A new 2-color, 4-p catalog describes the Austin Overshot Loader models 4-C and 6-C. These models are engineered to fit the Caterpillar D4 and D6 tractors. Mechanical features and operating principles are discussed.—**Austin Div., Central Ohio Steel Products Co., Galion, Ohio.**

MOTOR GRADER—The complete story on the Allis-Chalmers Model D motor grader is told in a new catalog now available. It's profusely illustrated and contains full specifications. Ask for form MS-451.—**Allis-Chalmers Tractor Div., Milwaukee, Wis.**

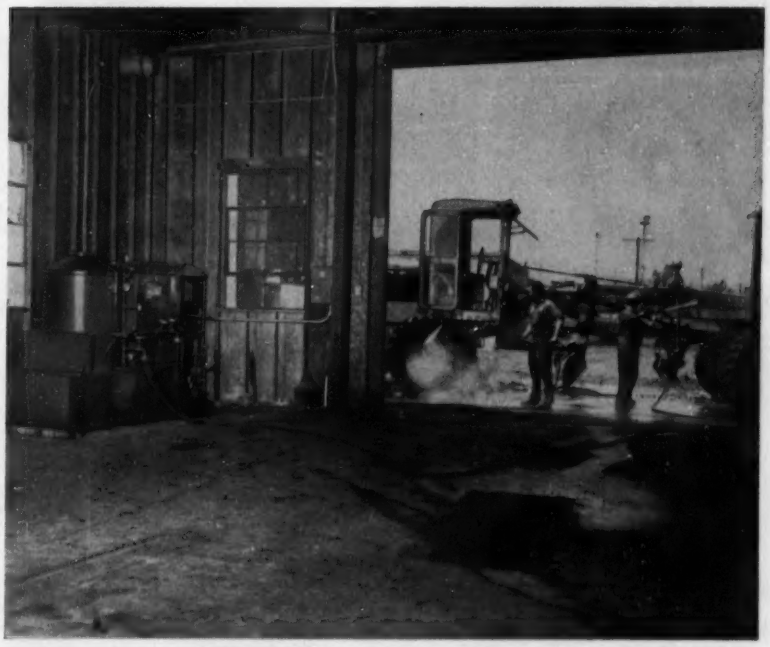
CONVEYOR BELTS — "Conveyor Belts by Hamilton" is a new 30-p catalog dealing specifically with industrial rubber conveyor belting. The catalog contains many typical, full-page photographs of belting installations, plus informative technical data on belting instructions. It can be obtained from **Hamilton Rubber Mfg. Corp., Trenton, N. J.**

CONCRETE SHRINKING—Shrinking in concrete can be compensated by metallic aggregate, combined when manufactured with a plasterizing material, a cement dispersing agent and a catalyst. The story is told in an 8-p booklet describing Vibro-Foil. This is a good booklet for architects, engineers, contractors and maintenance superintendents.—**A. C. Horn Co., Inc., Long Island City 1, N. Y.**

NEW 1½-YD SHOVEL—Action pictures of the new American 750 1½-cu yd shovel and 35-ton crane in quarries and gravel plants are included in a new catalog, now available. You can get a copy from any American distributor or from **American Hoist & Derrick Co., St. Paul 1, Minn.**

ROLLERS—Two new booklets covering the roller line of Buffalo-Springfield are available through dealer outlets or direct from the manufacturer. Ask for forms S-63 and S-60.—**Buffalo-Springfield Roller Co., Springfield, Ohio.**

NEW LOADER LINE—An 8-p, two-color bulletin on the Le Roi-Transo 1½-yd loader describes the many features found on the 4-wheel drive unit. Copies of the bulletin may be obtained by writing to **Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis.**



MALSBARY 322 steam cleaner, with two guns in use simultaneously, blasts grease, road oil and mud from Caterpillar No. 12 Grader in a hurry.

What Size Steam Cleaner Should You Use?

L. G. Defelice & Son, Inc., nationally-known contractor keeps his MALSBARY 322 HPC cleaner busy 10 hours daily, 6 days a week, maintaining this fleet in work trim:

30 D8's	12 DW20's
8 DW21's	4 Northwest shovels
70 trucks	15 compressors

If you have a large fleet like this, heavy, sticky road tars, thick mud and greasy dirt, enough cleaning to keep one man or more busy full time, then you need a MALSBARY HPC cleaner. HPC (patented) = high pressures to 400 lbs. combined with either hot solution to 325° F., cold water, or steam.

If your work calls for intermittent cleaning, or only two to three hours cleaning at a time, chances are a MALSBARY steam vapor cleaner will handle your job very well.

Why HPC Cleans Better, Faster

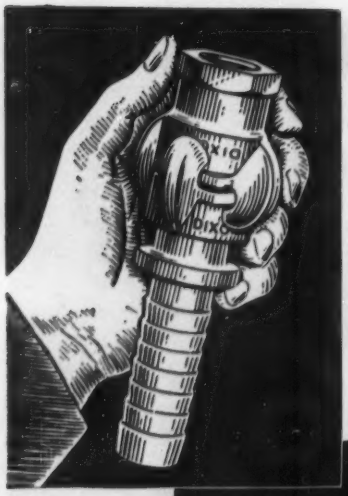
MALSBARY HPC cleaners use pumps instead of steam for pressure. They can produce: (1) cold water to 400 lbs. for fast removal of caked dirt and mud; (2) hot solution at 325° F. and 150-250 lbs. for cleaning away grease and road oils; (3) hot water at 250-325 lbs. to de-ice equipment or soften caked mud; (4) warm water for hand washing trucks, tractors, etc.; (5) wet steam for degassing tanks and for heating use. Models 300 and 500 operate two or more guns simultaneously, one delivering high-pressure cold water, the other high-pressure hot solution—a real time saver on big rigs and fleets.

Ask for Demonstration

Ask your MALSBARY jobber NOW to recommend and demonstrate the right size cleaner for your job... or write TODAY for Catalog 150-R, which describes the entire MALSBARY line. 53

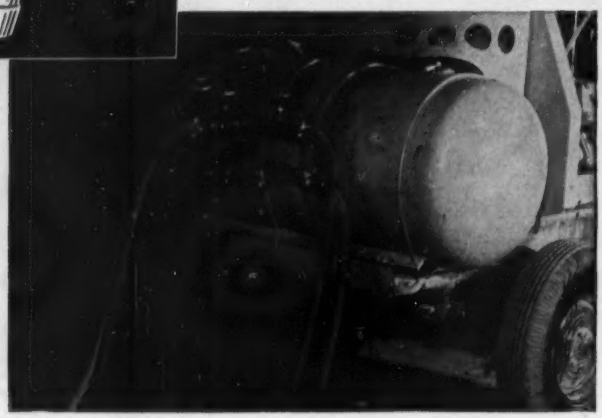
MALSBARY SINCE 1921 MANUFACTURING CO.

Room C6, 845 92nd Avenue Oakland 3, Calif.



THIS *Versatile Coupling*

while used primarily for air-operated tools in field and factory, is equally efficient for water, oil and spray service. Illustration shows hose end and female I.P.T. end connected.



"AIR KING" *Quick-Acting Universal* HOSE COUPLING

The "AIR KING" will reduce operating costs on every job requiring quick connection. Heads are locked by simply pressing together and giving one a quarter-turn. These locking heads are identical for all sizes of hose or threaded ends, permitting the coupling of any two sizes of hose, or hose and pipe, within the "AIR KING" size range. Equipped with patented safety locking device. Available in bronze or rustproofed malleable iron, in sizes up to 1".

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ASSOCIATE COMPANIES—BUCK IRON COMPANY, INC., QUARRYVILLE, PA. • PRECISION DRAWN STEEL COMPANY, CAMDEN, N.J.

STEEL FORMS FOR CONCRETE CONSTRUCTION—A new 50-p Bulletin No. 2430 titled "Blaw-Knox Steel Forms for Concrete Construction," describes a wide variety of forms, types and uses and contains practical design suggestions for economical adaptation of steel forms, as well as recommended data to be sent in with inquiries. Copies of this excellent publication may be obtained by writing **Blaw-Knox Co., Steel Forms Dept., P. O. Box 1198, Pittsburgh 30, Pa.**

WELDING AND FLAME CUTTING—A 36-p catalog listing all the major and most frequently needed items in welding and flame cutting has just been released by **National Welding Equipment Co. of San Francisco, Calif.** Included with this descriptive material is a price list covering the items listed in the book.

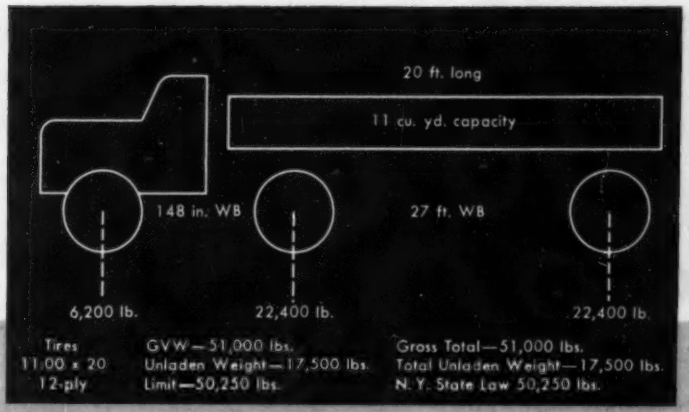
READY-MIX CONCRETE FACTS—An interesting folder covering facts regarding transportation of ready-mix concrete has just been released by **White Motor Co., Cleveland 1, Ohio.** It describes briefly how the trucks were tailored to six-wheelers better to serve the ready-mix industry.

HYDRATORK DRIVE—Design, operation and maintenance of the recently introduced clutchless Hydratork Drive, a torque converter and special design constant-mesh transmission are covered in a new 8-p illustrated brochure just published by **Clark Equipment Co., Battle Creek, Mich.** Clark is a leading producer of materials handling and automotive equipment and construction machinery.

BATTERY UNIT FOR WELDING—A new KSM Battery Unit which supplies power for welding studs up to ½-in. base diameter is described and illustrated in a specification sheet recently released by **KSM Products, Inc., 322 Woodland Ave., Merchantville, N. J.**

JAW CRUSHER—A colorful 24-p booklet gives full information on the Traylor "M" crusher. This jaw crusher is built in eight sizes with capacities up to 300 tons per hr. The bulletin shows outstanding features of the Traylor jaw crusher construction by use of cutaway illustrations and exploded drawings. Ask for Bulletin 1124 from the **Traylor Engineering and Mfg. Co., Allentown, Pa.**

CONCRETE PRESSSURE PIPE—Instructions for laying concrete pressure pipe are contained in a pocket-size 16-p booklet just released by **Price Brothers Co., Dayton, Ohio.** The manual tells how to dig the trench, handle the pipe, make the joint and bed the pipe.



PAYLOAD diagram tells why Colonial's fleet of Whites pays off. Here is weight distribution on Model WC22PLT White with Marion Cable 11-yd. Dumper.

Colonial Sand & Stone Co., Inc., New York, tells how

FLEET OF WHITES

boosts payload ...reduces trip time

GET THE FACTS about the advantages of White Payload Design for your business—it pays off in extra payload, first day in service, and counts up to an amazing annual savings.

The diagram above shows how Colonial Sand & Stone Co., Inc., cuts down trip time, improves customer service because of the maneuverability and versatility of this unit and boosts payload.

Quality Whites carry bigger loads and have the rugged power and stamina to keep rolling up the trips and miles, day after day, regardless of load and terrain conditions.

See your White Representative for facts.

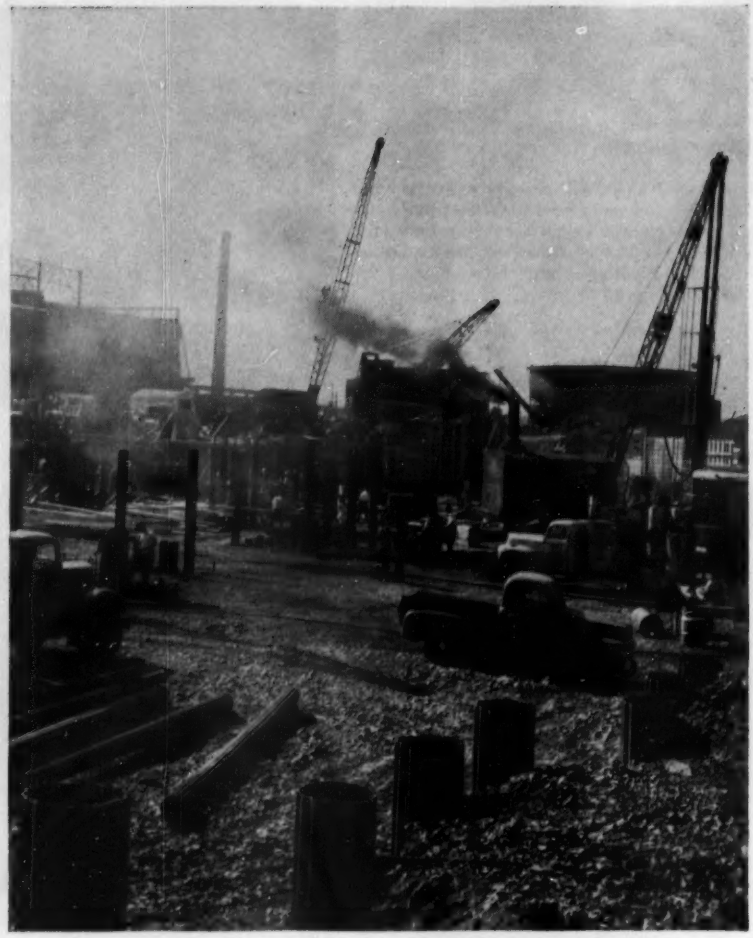
White

THE WHITE MOTOR COMPANY

Cleveland 1, Ohio

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

If FASTER COMPLETION cuts costs...



For huge industrial projects like this, or for the smallest of jobs, Monotube piles meet every engineering requirement while saving time and dollars.

Monotube Foundation Piles

look how MONOTUBE PILES can help!

1. LIGHT WEIGHT. Much faster driving due to reduced inertia. No need for a core or mandrel. More piles driven per rig per shift!

2. SIMPLIFIED PROCEDURE. Light standard cranes suffice. They move in quickly. Setup and moving time is cut. Over-all time and costs are reduced.

3. EXTENDIBILITY. Quickly, easily weld-spliced to *any* length, on the spot, using standard extensions or cutoffs. Because of light weight, high strength and easy handling, field welding goes *fast.* No difficult welding operations.

Here are just a few of the cost-important reasons why more and more jobs are getting off to a good start with Monotube piles. Get *all* the facts. Write to The Union Metal Manufacturing Co., Canton 5, Ohio, for Catalog No. 81.

UNION METAL

DRAGLINE BUCKET—Of special interest to the contractor, who requires a lightweight dragline bucket which will efficiently dig and economically load clay, earth, sand or gravel, is the 4-p illustrated catalog on the new Page RL class lightweight automatic dragline bucket. Get copies from **Page Engineering Co., Clearing Post Office, Chicago 38, Ill.**

IMPACT BREAKER—A folder describing the Kennedy Cuber Senior, a dual rotor, up-running impact breaker which features a multi-stage, triple action reduction principle for both primary and secondary breaking of non-abrasive stone and material in a single unit, is now being distributed. The bulletin number is D-3648.—**Kennedy-Van Saun Mfg. and Eng. Corp., Danville, Pa.**

EASY TO UNDERSTAND—Here's a catalog the manufacturer claims you can understand even though you cannot read English! It's the 80-p Redi-Fab Conveyor erection and operation manual just released by Barber-Greene. The clarity of the catalog results from the hundreds of illustrations which show all phases of erection and operation. Ask for the new B-G manual.—**Barber-Greene Co., Aurora, Ill.**

REPLACEMENT CHAINS—A 12-p catalog covering the complete line of Kenkrome replacement chains for cement, sand, gravel, crushed stone, brick and clay plants is now available. Free copies may be received by writing to **Kensington Steel Co, 505 Kensington Ave, Chicago 28, Ill.**

Hot Tunnel

(Continued from page 57)

ating the motors will cool by adiabatic expansion. At good operating efficiency the discharge could be substantially below 0 F. Actually, McGregor says they will be happy if discharge is near freezing.

After completing the drilling, the miners started to load the holes. A train was leaving the heading so we hopped aboard. There was a delay at a cross-over track while the Eimco 21 air-operated mucker was moved out of the way. This is where the tunnel was hot and work was difficult. All the air at the heading made it seem cool, but at the passing track it was different. And that was in spite of bleeding off some fan air at this important work area.

Blasongame, the superintendent,

(Continued on page 211)

PIASECKI HOOKS ON TO

SAFETY WITH LAUGHLIN

From Thule to Tahiti versatile Piasecki helicopters are building a new tradition of usefulness and dependability. It's the kind of service where equipment has to be right—*all the time.* That's why Piasecki looked to Laughlin as the logical source for the swivel safety hooks used on the end of lifting and rescue cables in both rescue and workhorse helicopters.

These Duronze #3 safety hooks are non-sparking, have silicon bronze spring, bolt and latch, provide 90,000 lbs. ultimate tensile strength/sq. in. and are available from stock. Because the latch locks the load, it *can't* jolt off accidentally.

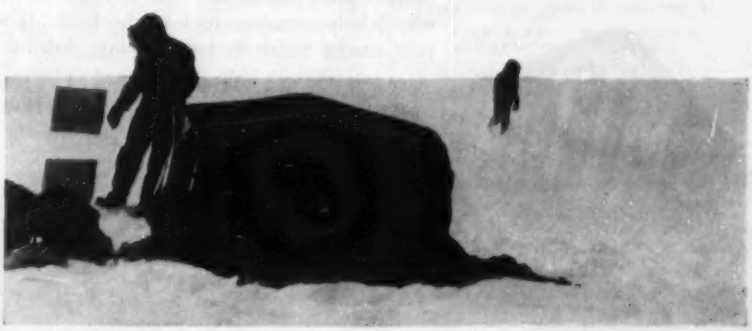
More and more safety- and economy-minded manufacturers are learning that Laughlin is their best source for quality drop forged fittings for wire rope and chain. Over 1500 types and sizes immediately available from stock make ordering easy.

Why not ask your supplier salesman to show you how Laughlin products can help in your business? Or write for new Catalog No. 155.

For Safety's Sake say

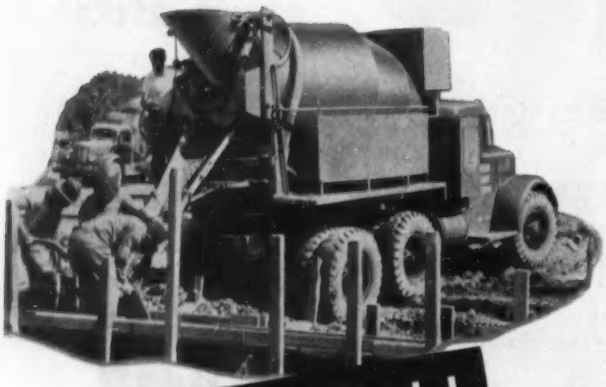
LAUGHLIN THE FULL LINE OF WIRE ROPE AND CHAIN FITTINGS

The Thomas Laughlin Company, 614 Fore St., Portland, Maine



BRAND NEW TIME-TESTED TRUCK MIXERS

2 Reasons Why SMITH Continues to Lead the Field!



DELUXE Model
— the Finest Truck Mixer that Money Can Buy

You want nothing but the best. Then be sure to investigate the new Smith De Luxe Truck Mixer. It's a brand new mixer, completely redesigned for even greater efficiency. This De Luxe Model weighs 500 lbs. less than the previous De Luxe. Overall length is much shorter. Better weight distribution allows bigger legal payloads. New 2-speed transmission, built to aircraft specifications, has lifetime Helical gears, ground shafts and multiple disc clutches running in oil. The entire engine is easily accessible. All this, with no increase in price. And remember, this De Luxe Model is backed by a company that enjoys recognized leadership in the industry.

If you want to combine economy with top quality, the Smith Premium Model is the answer. It's NOT built down to a price. In fact, it's the world's finest truck mixer, except for the Smith De Luxe Model. This Premium Model is 800 lbs. lighter, size for size, than the De Luxe. Overall height is cut down to get under bins with low headroom. Features include dependable 2-speed transmission, drum speeds from 3 to 15 r.p.m., and dual push button water control — front and rear. Price? Believe it or not, it's MUCH LOWER. You save hundreds of dollars and still get top quality.

PREMIUM Model
— the First Low-Cost High Quality Truck Mixer

Both of these Models are built to the usual Smith high standard of quality. That's why Smith continues to lead the field. It will pay you to investigate. Contact your nearby Smith dealer — today. Ask for literature.

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2851 NORTH 32ND STREET • MILWAUKEE 10, WISCONSIN, U.S.A.
Affiliated with Essick Manufacturing Co., Los Angeles, California

SMITH
THE T. L. SMITH CO. MILWAUKEE, U.S.A.

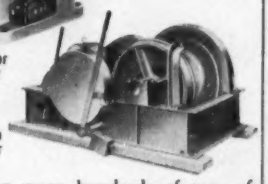
CONCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

"Superior" Electric

Carpullers

CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES



Model SC Superior Capstan Carpuller

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One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

Write for bulletins and catalogs!

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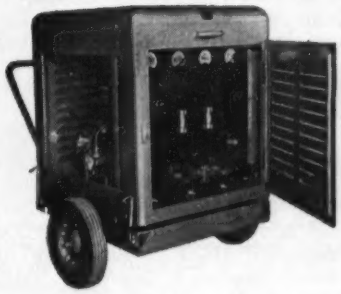
Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
New York Office, 7 Dey Street, New York 7, N. Y.

Power in a handy "package!"



Easy to move because it's balanced. Doors of this portable Electric Plant open for operation. Entire weatherproof housing is quickly removable for servicing. Gas tank is underneath for extra safety. Dependable "U.S." unit is D.C. for battery charging or operating portable tools. Available also in A.C. "U.S." builds the world's most complete line. *Write for information, briefly stating your requirements.*

UNITED STATES MOTORS CORP
420 Nebraska St.
Oshkosh, Wis.

HOT TUNNEL . . .

Continued from page 209

and E. H. Kubsch, the master electrician, climbed into a muck car with water up to their necks. McGregor motioned me to do likewise. So I handed them my camera to hold up out of the water, took my wallet (wrapped in plastic) and my spare film out of my pocket and climbed in. McGregor and Ray Roberts, the shift walker, followed suit and that's how we travelled through the hottest part of the tunnel as far out as the pump room. McGregor and I got off at the pump room so I could look around and take some photos.

While we were waiting at the pump room they blasted at the heading, and I must have jumped a foot. Mac and the pump-room operator grinned at my being startled.

Four Rounds: 20 Ft

After a while the train came back from the heading with three cars full of workmen up to their necks in water. We climbed on a man-haul car and were switched under the hose for the 2-mile trip out. The crew got off a few hundred feet down the track where a cold water underground spring provided good drinking water and cooled the tunnel a little, making it a good spot for them to eat lunch.

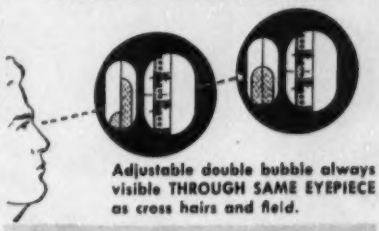
Well, Rich, that's about it. The Coker-Kiewit outfit has been at the heading a month now and made almost 400-ft progress. Twenty feet in four rounds is considered a good day. And they certainly have tried to provide best possible working conditions. They've got a brand new change room in a Butler building outside. They're pumping as much air into the tunnel and as much water out as they can. The miners get the standard $2.42 an hour plus a 13c bonus pay. And they work 54 hours a week (8 hours a shift at the heading plus time to change both going and coming). So you can figure what that means to them in overtime pay.

It looks now like a pretty sure bet that the Bureau of Reclamation will get its tunnel delivered on time in November 1955. Yet to be licked is the problem of concreting the rest of the bore. But if the Coker-Kiewit gang tackles that as well as it has the working conditions, the rest of the job should be a lead-pipe cinch.

Best regards,
LARRY WISE

SURVEYING NEWS

NEW LEVEL WITH DOUBLE BUBBLE IS "MISTAKE-FREE"



Adjustable double bubble always visible THROUGH SAME EYEPIECE as cross hairs and field.

- No need to turn telescope during leveling
- No need to look anywhere but through telescope to adjust level at any turn after initial set-up
- American type — erecting eyepiece, 4 leveling screws
- Unbelievably fast and accurate, yet simple-to-use. Economical!

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Please send me Booklet B with information on Fennel . . .

☐ Double bubble ☐ Alidades
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More for your money!

DAVEY ... TODAY'S BEST COMPRESSOR AND TOOL INVESTMENTS!

Davey Model 210 Super Chief

From the standpoint of original investment — and reduced operating costs — *you get more for your money with Daveys.*

DAVEY MULTI-PORT VALVES require less engine power and less fuel . . . never carbon or foul . . . assure constant full volume of air, keep tools operating at top efficiency. And, they're only one of many features of today's fine Davey lightweight, heavy-duty compressors in 60-125-160-210-315-500-600 c.f.m. sizes.

DAVEY AIR TOOLS are designed to meet today's needs! They're streamlined . . . perfectly balanced . . . easier to handle . . . hard-hitting with extra high penetrating power. And, because they offer maximum parts interchangeability, they greatly reduce maintenance and repair expense.

For complete details, see your nearest Davey distributor!

Davey Backfill Tampers, 35 and 45 lb. sizes

Davey Rock Drills, 4 sizes 28 to 58 lbs.

Davey Paving Breakers 4 sizes—35 to 90 lbs.

DAVEY pioneers of "air-cooled air"

A-9254

DAVEY COMPRESSOR CO.
KENT, OHIO

IT'S YOUR BUSINESS . . .

Continued from page 28

42, North-South Freeway and new Delaware River Bridge approaches and connections for the New Jersey State Highway Dept., State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. $7,804,829.

Koppers Engineering & Construction Co., 926 Koppers Bldg., Pittsburgh 19, Pa. Polyethylene plastics plant at Port Arthur, Tex. for Koppers Co., Koppers Bldg., Pittsburgh. $75,000,000.

J. A. Jones Construction Co., 209 W. 4th St., Charlotte, N. C. New lock No. 19, Stage 11 on Mississippi River in Iowa for U.S. Engineers, Clock Tower Bldg., Rock Island, Ill. $7,995,666.

Morrison-Knudsen Co., Inc., C. J. Maney Co., Inc., Peter Kiewit Sons' Co., 122 East 42nd St., New York City. Drainage tunnel, Ward St. Pumping Station to Deer Island, Roxbury and Boston for Metropolitan District Comm., Construction Division, 20 Somerset St., Boston, Mass. $11,875,062.

H. C. Price Co., Bartlesville, Okla. 58-mi 30-in. welded joint gas line from Ceredo to Lanham compressor station, West Virginia, for United Fuel Gas Co., 1033 Quarrier St., Charleston, W. Va. $6,683,000.

Catalytic Construction Co., 1528 Walnut St., Philadelphia. Design and construct catalytic cracking unit and houdriformer catalytic unit to produce gasoline components at Marcus Hook, Pa. for Sun Oil Co., 1608 Walnut St., Philadelphia. $14,000,000.

Whiting Turner Contracting Co., National Marine Bank Bldg., Baltimore 2, Md. Consolidated mechanical shops in Baltimore for Esso Standard Oil Co., Baltimore Refinery, Boston & Dean Sts., Baltimore 2, Md. $15,000,000.

Peter Kiewit Sons' Co., & Le Boeuf-Daugherty, Longview, Wash. 5,897-ft. concrete bridge and south approach on 1.67 mi U.S. highway in Bonner Co. for State Highway Department, Boise, Idaho. $1,135,-332.

COMING . . . in July
Equipment-Maintenance Directory

Wilbur Cross Parkway at south end of West Rock's twin-bore tunnel. Highway continues on north side of mountain. Two 24-foot concrete roadways are divided by a grassy median strip. Twelve traffic interchanges permit a free flow of traffic on and off the Parkway. Grade crossings have been eliminated by 19 overpass bridges and 19 underpass bridges.

Parkway Tunnels Help Motorists Escape New Haven Traffic Tangle

West Rock Tunnels are 1200-ft long, and each tube has two lanes. They are equipped with automatic ventilators, traffic control signals, and an elaborate lighting system that matches at all hours the day or night conditions outside the tunnel.

Before the West Rock Tunnels were completed, motorists had to wind through New Haven. Above, Route 10 on Chapel Street near San Raphael Hospital. During rush periods the Parkway saves an hour's driving time.

A few years ago, a trip between New York City and New England inevitably included a bout with New Haven's heavy traffic.

Today, thanks to the West Rock Tunnels, drivers can avoid the New Haven bottleneck and enjoy the Wilbur Cross Parkway's full 29 miles. Named for a former governor, the Parkway rolls northeastward from the Housatonic River Bridge at Milford to the Berlin Turnpike at Meriden.

Estimated cost of the Wilbur Cross Parkway was $17,500,000. Bethlehem furnished steel for the highway, bridges and tunnels.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Standardizes on NORDBERG Diesel Light Plants for 1400-DE Shovels

The P & H Model 1400-DE Diesel Electric Crawler Mounted Shovel recently announced by Harnischfeger Corporation includes numerous advantages of interest to profit-minded contractors.

In keeping with their constantly high standards of quality, P & H are installing NORDBERG Diesel Light Plants as standard equipment on the Model 1400-DE shovels.

These Nordberg Diesel Generator units are compact, heavy duty, one-cylinder 4½" bore x 5¼" stroke engines, direct connected to 6 K.W. generators — providing ample capacity for the powerful lights used in "around-the-clock" operations.

Built in 1, 2 and 3-cylinder models, these reliable, low cost Nordberg Diesels are available as power units in sizes from 10 to 45 hp; as generator sets from 6 to 30 K.W.; and as pumping units in capacities from 200 to 3,000 gpm at 15 to 240 ft. total head.

And remember—Nordberg Diesels are backed by over 60 years' experience in the design and construction of heavy duty machinery for the world's industries. Clip the coupon for full details.

NORDBERG MFG. CO., Milwaukee, Wisconsin

NORDBERG

Builders of America's Largest Line of Heavy Duty Diesels — 10 to over 10,000 H.P.

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Send me full details about your "4FS" Diesels.

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Advertisers in this Issue

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A

Adams Mfg. Co., J. D. 111
Advance Scaffold Div., Beaver Art Metal Corp. 120
Aeroquip Corp. 187
Air Placement Equipment Co. 122
Alemite Div., Stewart Warner Co. 87
Allis-Chalmers (Tractor Div.) 12, 13, 184
Allison Div., General Motors 44, 45
American Mine Door Co. 192
American Steel & Wire Div., United States Steel Corp. 96, 145
Athey Products Corp. 47
Austin-Western Co. 24, 25

B

Bacharach Industrial Instrument Co. 102
Baker-Lull Corp., The 92
Barber-Greene Co. 16
Barco Manufacturing Co. 109
Bay City Shovels, Inc. 84, 85
Beaver Art Metal Corp. (Advance Scaffold Div.) 120
Bethlehem Steel Co. 163, 213
Blackhawk Mfg. Co. 185
Blaw-Knox Company (Blaw-Knox Equipment Div.) 219
(Foote Construction Equip. Div.) 204
Borne, Scrymser Co. 30
Broderick & Bascom Rope Co. 72
Bros Boiler & Mfg. Co., Wm. 83
Buck Equipment Corp. 176
Bucyrus-Erie Company 80, 143
Buda Company Div., Allis-Chalmers Mfg. Co. ..... 2nd Cover
Butler Bin Company 112

C

Caterpillar Tractor Co. 19, 27, 51, 69
Chain Belt Co. 196
Chevrolet Div., General Motors 22, 23
Chrysler Corp. (Ind. Eng. Div.) 183
Cities Service Oil Co. 103
Clark Equipment Co. (Construction Machinery Div.) 135
Cleveland Trencher Co., The 201
Commerical Shearing & Stamping Co., The 194
Construction Machinery Co's. 86
Continental Scaffolding Co. 98
Contractors Pump Bureau 165
Crucible Steel Co., of America 6

D

Davey Compressor Co. 212
Detroit Diesel Eng. Div., General Motors 119
Dixon Valve & Coupling Co. 206
Dodge Div., Chrysler Corp. 190
Drott Mfg. Corp. 41
Duff-Norton Mfg. Co. 191
DuPont de Nemours & Co., Inc., E. I. (Polychemicals Dept. Zerone-Zerex) 123

(Continued on page 216)

COMING — In July

Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance. The theme will be "Productive Maintenance."

WATCH FOR IT!

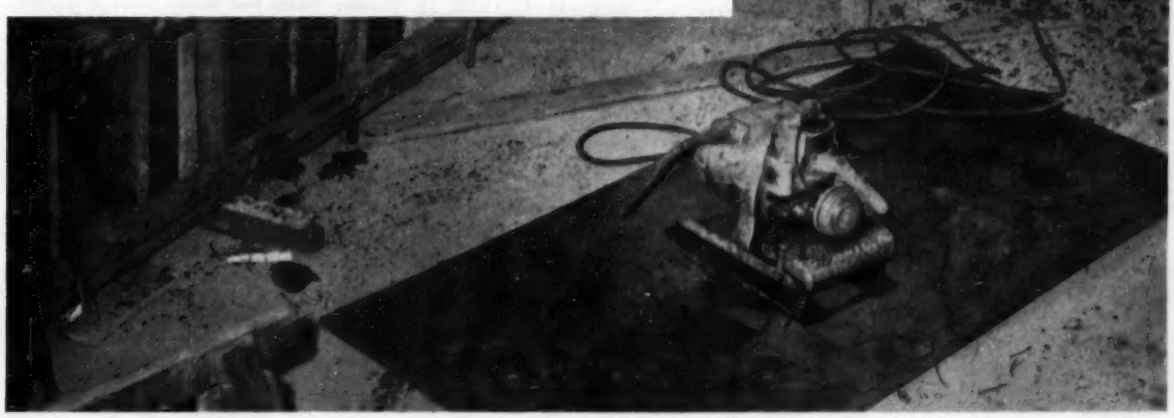
(Advertisement)

With Homelite Carryable Generators...

contractors are now operating cost-cutting, labor-saving, one man high cycle electric concrete vibrators. Note the absence of special staging normally required for both operator and gas-engine powered vibrators. The Homelite generator stays on the ground, out of the way of the actual pouring operation and is easily moved to any spot where needed. Homelite generators also provide power for money-saving electric drills, saws and flood-lights. For complete information, write

HOMELITE CORPORATION

1006 RIVERDALE AVENUE • PORT CHESTER, N. Y.



(Advertisement)

VERTICAL PRESTRESSING OF CONCRETE walls for a concrete water tank is done with a Re-Mo-Trol hydraulic jack. Six wires, which are secured in the bottom of the wall, are prestressed at one time.

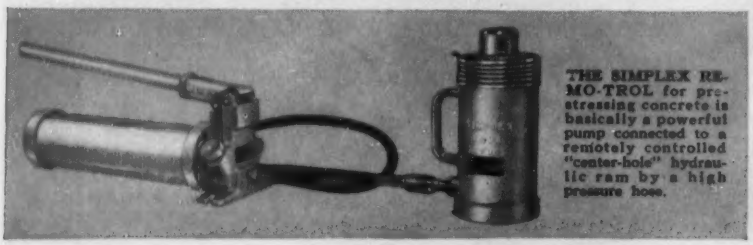
Remote-Controlled Hydraulic Puller Perfected for Prestressing Concrete

Construction Men Cite Simplex Unit for Fast, Easy Use

Tensioning cable, wires or rods for concrete prestressing is being done easily and quickly with Simplex hydraulic "center-hole" pullers, a number of construction men report. Because the unit is actually made up of two parts, a remotely controlled ram and a pump, the puller is more easily handled than conventional hydraulic jacks, they explain. The pump unit can be located nearby where it is most convenient for the operator. Many users install a pressure gauge, available as an accessory, between the pump and the puller to check the amount of prestressing applied. This Simplex Re-Mo-Trol puller is also useful on construction jobs as a powerful jack for lifting equipment and building sections, for aligning heavy beams, etc., and for testing the load bearing ability of the soil. Available in 7 models with capacities from 10 to 100 tons, it works in tight spots and enables workmen to stay at a safe distance while lifting, pulling or pushing.

Made by the world's largest manufacturer of industrial jacks, the Re-Mo-Trol is only one of many Simplex jacks that are useful in the construction industry. Others include the famous Jenny self-contained "center-hole" puller, the No. 310A Emergency Jack which lifts 15 tons on the cap, on the toe, on a cap shoe or at intermediate heights with a chain sling, and standard hydraulic, screw and ratchet lowering jacks. They are all described in General Catalog No. 53. Write for a free copy.

TEMPLETON, KENLY & CO.
2509 Gardner Road • Broadview, Illinois



THE SIMPLEX RE-MO-TROL for prestressing concrete is basically a powerful pump connected to a remotely controlled "center-hole" hydraulic ram by a high pressure hose.

Advertisers Index

(Continued from page 214)

E

Eaton Mfg. Co. (Axle Div.) 73
Eimco Corp., The 136, 137
Electric Storage Battery Co., The (Automotive Div.) 170
Euclid Div., General Motors Corp. 8, 9

F

Felker Manufacturing Co. 89
Fennel Instrument Corp. of America 211
Fleco Corp. 153
Fiske Bros. Refining Co., (Lubriplate Div.) 82
Flexible Steel Lacing Co. 198
Foote Construction Equipment Div., Blaw-Knox Co. 204
Ford Motor (Ford Div.) 139
Funk Aircraft Co. 198

G

Galion Allsteel Body Co., The 116
Galion Iron Works & Mfg. Co., The 149
Gar-Bro Mfg. Co. 26
Gar Wood Industries, Inc., (Tractor Equipment Sales) 189
Gardner-Denver Co. 29
Gilson Screen Co. 202
GMC Truck & Coach Div., General Motors 101
Goodall Rubber Co. 125
Goodrich Co., The B. F. (Tire & Equipment Div.) 1
Grace Mfg. Co., W. E. 218
Gradall Div., Warner & Swasey Co. 40
Griffin Wellpoint Corp. 152
Gulf Refining Co. 133

H

Harnischfeger Corp. 97
Hartford Fire Insurance Co. 154
Haynes Products Co. 192
Heltzel Steel Form & Iron Co., The 203
Hercules Powder Co., Inc., (Explosives Dept.) 118
Hetherington & Berner, Inc. 126
Homelite Corp. 215
Hough Co., Frank G. 195

I

International Harvester Co., Inc., (Industrial Power Div.) 32, 33, 34, 35, 36
(Motor Truck Div.) 200
Iowa Mfg. Co. 100

J

Jackson Vibrators, Inc. 162
Jaeger Machine Co. 49
Johns-Manville (Industrial Friction Materials) 117
Johnson Company, C. S. 107
Joy Mfg. Co. 15

K

K.S.M. Products, Inc. (Stud Welding Div.) 48
Kalamazoo Mfg. Co. 14
Knickerbocker Stamping Co. 176
Koehring Co. 107
Kwik-Mix Co. 107

L

Laclede Steel Co. 142
LaCrosse Trailer Corp. 104
Laughlin Co., The Thomas 209
Lebus Rotary Tool Works, Inc. 105

Advertisers Index

Le Roi Company 160, 161
Leschen Wire Rope Div.
H. K. Porter Co., Inc. 113
LeTourneau-Westinghouse Co. 128, 129, 130, 131
Lincoln Electric Co., The 90
Link-Belt Speeder Corp. 46
Lone Star Cement Corp. 5
Lubriplate Div., Fiske Bros. Refg. Co. 82
Lufkin Rule Co., The 168

M

Macwhyte Co. 3
Madesco Tackle Block Co. 156
Mall Tool Co. 2
Malsbary Mfg. Co. 205
Manhattan Rubber Div. 179
Marlow Pumps Div. Bell & Gossett Co. 76, 77
Marvel Equipment Co. 182
Master Builders Co. ..... 3rd Cover
Maxon Construction Co. (Mfg. Div.) 91
Mid-Western Industries, Inc. 11, 192
Minneapolis-Moline Co. 99
Moretrench Corp. 70
Murphy Diesel Co. 124

N

Naylor Pipe Co. 120
Nordberg Mfg. Co. 214
North America, Insurance Co. of 146
Northwest Engineering Co. 7

O

O.K. Machinery Div., John C.
Motter Printing Press Co. 186
Oliver Corp., The 88
Owen Bucket Co., The 17

P

Pacific Car & Foundry Co. 132
Parsons Co. 106, 107
Patent Scaffolding Co., Inc. 172
Phillips Petroleum Co. 175
Powder Power Tool Corp. 155
Power Products Corp. 93

R

Ramset Fasteners, Inc. 178
Raybestos-Manhattan, Inc. 179
Remington Arms Co. (Ind. Sales Div.) 199
Rogers Bros. Corp. 10

S

Safway Steel Products, Inc. 148
Salem Tool Co., The 152
Sanstorm Mfg. Co. 198
Sauerman Bros., Inc. 186
Shawnee Mfg. Co., Inc. 168
Shell Oil Co. 81
Shunk Mfg. Co. 28
Sinclair Refining Co. 167
Smith Co., The T. L. 210
Standard Dry Wall Products 217
Standard Oil Co. of Calif. 127
Standard Oil Co. (Indiana) 37
Stang Corp., John W. 114
Superior Concrete Accessories, Inc. 74
Superior-Lidgerwood-Mundy Corp. 211
Symons Clamp & Mfg. Co. 108

T

Talbert Construction Equip. Co., The 150
Templeton Kenly & Co. 216
Texas Co. 20, 21
Thew Shovel Co. 31
Timken-Detroit Axle Div.
Rockwell Spring & Axle Co. 38, 39
Timken Roller Bearing Co. ..... 4th cover
Tirfor Griphoist, Inc. 138
Transport Trailer, Inc. 165
Traylor Engrg. & Mfg. Co. 193
Transit Sales & Service, Inc. 192
Twin Disc Clutch Co. 166

U

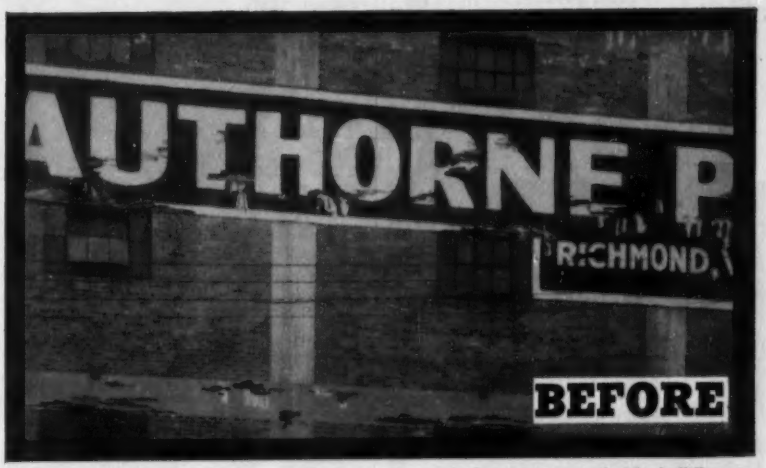
Union Metal Mfg. Co. 208
Union Wire Rope Corp. 140, 141
Unit Crane & Shovel Corp. 164
United States Envelope Co.
(Cup Div.) 169
United States Motors, Corp. 211
United States Steel Co. 96, 145, 177
Universal Engrg. Corp. 157
Universal Form Clamp Co. 43
Upson-Walton Co., The 151

V

Viber Co. 197

(Continued on page 218)

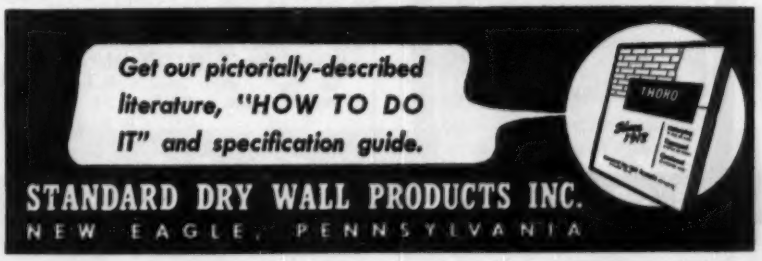
THORITE patching mortar and two THOROSEAL applications rejuvenated this Virginia building



Constant weather exposure over the years caused the masonry of this building to disintegrate. If this unsightly condition had not been corrected it would have finally imperiled the structure of the building.

All concrete spandrel beams, columns, window heads and brick sills were patched and brought flush with surrounding surface by the use of The THORO System product, THORITE, a twenty-minute set, nonshrink, patching mortar. Two brush coats of THOROSEAL were then applied over entire reinforced concrete surfaces, to prevent further disintegration, also to beautify building.

CONTRACTOR: Southern Waterproofing and Concrete Company, Inc., 1704 Arlington Road, Richmond, Virginia.

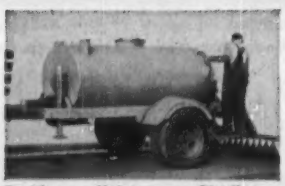

Get our pictorially-described literature, "HOW TO DO IT" and specification guide.
THORO
STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

GRACE

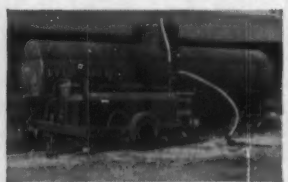
3 sweeper models, axle, engine or tractor powered.

Sheepsfoot Rollers 250 to 600 psi.

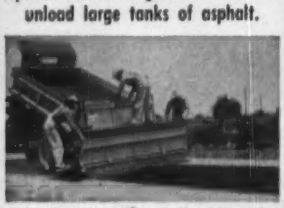
GRACE Asphalt and Compaction Equipment



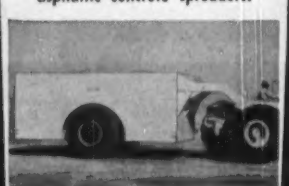
Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.



Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

6100 S. LAMAR, DALLAS, TEXAS

Advertisers Index

(Continued from page 217)

W

Waco Mfg. Co.	202
Warner & Swasey Co. (Gradall Div.)	40
Water Seals, Inc.	4
Waukesha Motor Co.	134
Wellman Engrg. Co.	188
White Co., David	176
White Mfg. Co.	192
White Motor Co., The	207
Whiteman Mfg. Co.	171
Winslow Engineering Co.	115
Wooldridge Mfg. Co.	147

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

Employment

Positions Vacant	218
Positions Wanted	218
Selling Opportunities Wanted	218
Educational	218
Equipment (Used or Surplus New)	
For Rent	218
For Sale	218
Piling	218
Wanted Equipment	218

CONSTRUCTION METHODS AND EQUIPMENT

330 West 42nd St., New York 36—LO 4-3000

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Howard T. Olsen, *Business Manager*

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W. D. LANIER, JR.

Cleveland 15, 1510 Hanna Bldg.
W. E. DONNELL

Chicago 11, 520 N. Michigan Ave.
F. G. HUDSON, KNOX BOURNE, D. J. McGRATH

St. Louis 3, Continental Bldg.
B. F. HORN

Dallas 1, First National Bank Bldg.
J. H. CASH

Los Angeles 17, 1111 Wilshire Blvd.
H. L. KEELER

San Francisco 4, 68 Post St.
R. E. DORLAND

Other Sales Offices
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Pittsburgh 22: 738 Oliver Bldg.
Boston 16: 350 Park Square Bldg.
London E.C. 4: 95 Farringdon St.

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EMPLOYMENT • BUSINESS EQUIPMENT — USED OR RESALE

OPPORTUNITIES

REPLIES (Box No.):
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NEW YORK: 330 W. 42 St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

WANTED: MECHANIC experienced in International, Letourneau, Euclid & Caterpillar equipment to work with highway grading firm in Wisconsin and Illinois. P-2473, Construction Methods and Equipment.

SELLING OPPORTUNITY OFFERED

MANUFACTURER'S REPRESENTATIVE Wanted: Construction and industrial vibratory equipment sold through equipment distributors. Selling experience and technical background necessary. After training, own territory in Southwestern states. Good future. RW-2930, Construction Methods and Equipment.

SELLING OPPORTUNITY WANTED

ENGLISH EQUIPMENT Company, substantial and old established are desirous of representing American Company. Advertisers specialize in the supply of all types of Building and Civil Engineering equipment. RA-2903, Construction Methods & Equipment.

WANTED

Construction Equipment wanted for our dealers overseas. Suitable for sale or rental. Exclusive basis. Perma-Stone International Ltd., 320 Fifth Avenue, New York 1.

RENT STEEL SHEET PILING

Get the exact lengths and sections you need from Foster—all standard makes, delivered *on time*—and at Foster's standard low rental rates. Also Rental Pile Hammers & Extractors.

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PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
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ENGINEERS—FOREMEN—OFFICE MEN
Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details
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CONSTRUCTION CONSULTANTS
411 So. 5th Ave., Lake Worth, Florida

GIANTS UNDER THE EARTH
The Construction of the Brooklyn-Battery Tunnel
This is the story of the key men of the miraculous 20th century—those hardy human sandhogs who dug under water and blasted through earth and rock to build the slick, modern tunnels we use today for fast motor and railroad traffic.
Illustrated and photos. Per copy.....$1.00
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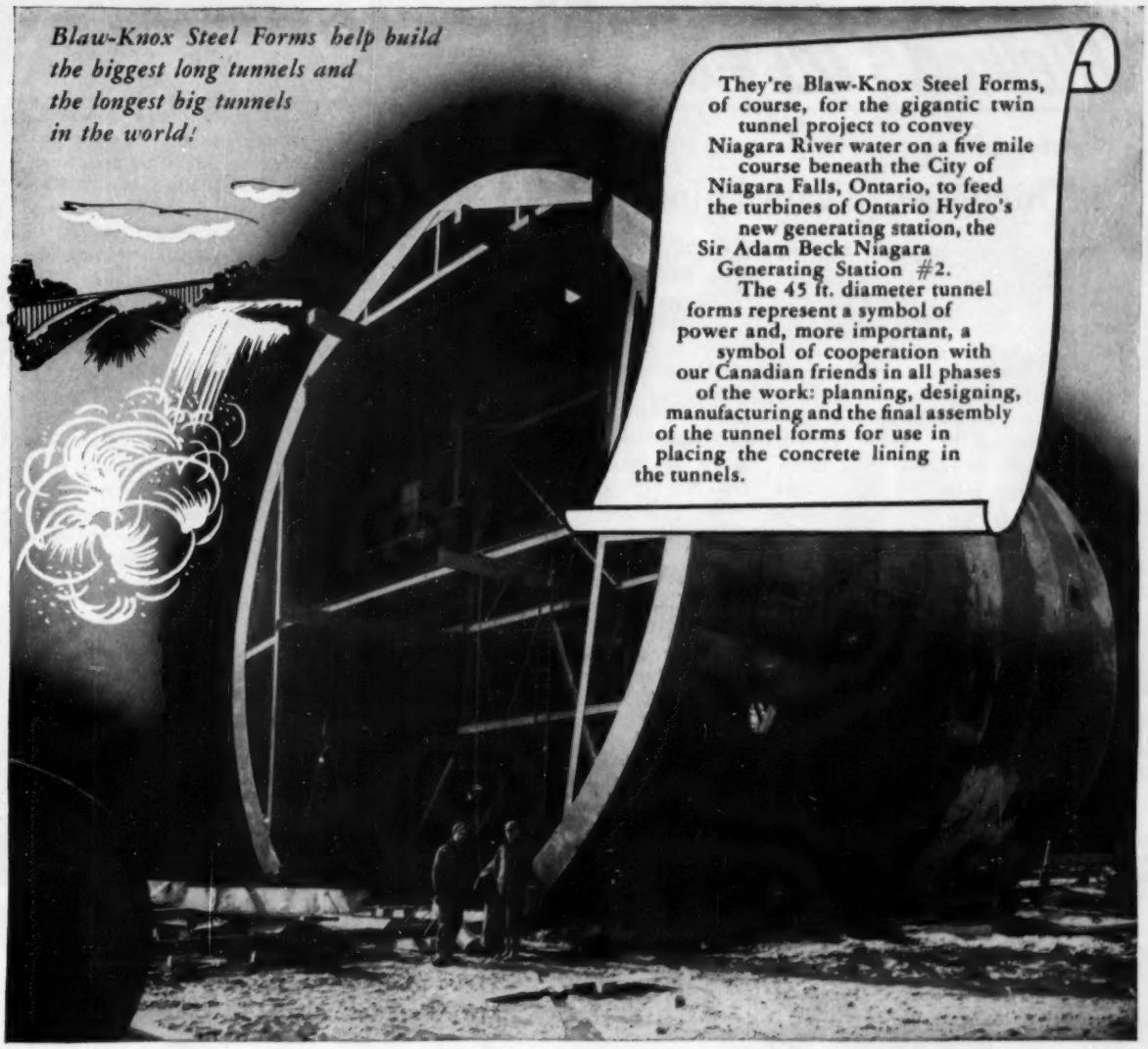
It'll PAY YOU TO SEE THE Davis Pit-Bull

AMERICA'S MOST VERSATILE EQUIPMENT

ON PAGE 11


Blaw-Knox Steel Forms help build the biggest long tunnels and the longest big tunnels in the world!
They're Blaw-Knox Steel Forms, of course, for the gigantic twin tunnel project to convey Niagara River water on a five mile course beneath the City of Niagara Falls, Ontario, to feed the turbines of Ontario Hydro's new generating station, the Sir Adam Beck Niagara Generating Station #2.
The 45 ft. diameter tunnel forms represent a symbol of power and, more important, a symbol of cooperation with our Canadian friends in all phases of the work: planning, designing, manufacturing and the final assembly of the tunnel forms for use in placing the concrete lining in the tunnels.

. . . . for every concrete placing job use BLAW-KNOX STEEL FORMS!

WHATEVER your concreting job . . . big tunnels, dams, bridges, or concrete installations of any kind . . . follow the lead of the builders of the Sir Adam Beck Niagara project. Call in Blaw-Knox engineers for the expert consultation service that assures efficient forming methods and results in close scheduling and fast progress in the concrete placing.

Blaw-Knox engineers, with over 40 years experience in solving tough or unusual concreting problems, get right to the heart of your problem, find the simplest, most economical method of solving it, and recommend the Blaw-Knox Steel Forms best suited for the job.

Get complete details today about the advantages of Blaw-Knox consultation service in the *preliminary* planning stage. Send for Bulletin 2035 today, or if you want detailed information fast, wire or phone.

BLAW-KNOX

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PA.
Offices in Principal Cities

BLAW-KNOX

Methods Memo . . .

Thirty-Five Years Point the Way...

CONSTRUCTION METHODS AND EQUIPMENT is rounding out its 35th year this month. And we are proud to report that it remains true to the ideals and goals set for the new magazine when Volume 1, No. 1 appeared as "Successful Methods" in July 1919.

We spent a delightful hour recently browsing through the pages of that first issue. In a foreword, the editor wrote, in part, "Men who build great and useful works must continually seek better tools and equipment and more successful methods of using them. Men who make tools and equipment must strive to place better products in the hands of users. Then both profit. . . ."

In an editorial, titled: "Fit the Tool to the Job," we read, "A manufacturer knows his tool in detail, when it can be used successfully, and methods to be followed in its successful use. Each tool sold is a new source of experience under a new set of conditions. A contractor knows in general the qualifications of many different kinds of tools for accomplishing a great variety of work. Specific and detailed knowledge of the type available to a manufacturer is hardly possible for him—nor is it generally desirable. A contractor operates many different kinds of plant.

"Herein lies the strength of the manufacturer's service. Complete knowledge of the tool and repair part requirements under all conceivable operating conditions makes possible the fatherly supervision of the life of the tool and maximum success results from its operation."

Interesting Content

CM&E has been a big-picture magazine from the beginning. Unconsciously, but unerringly, its early makeup used the popular and fast-reading photojournalism of today. There was a spread of pictures showing current construction work, headed, "Reducing Labor Costs With Machinery."

The lead article was on the subject, "Roadbuilding 24 Hours a Day." The job described was lighted with carbic lamps, using calcium carbide for fuel.

There was an article on how to reduce risks in earthwork. Subheads: "Experience necessary in estimating; prospecting for facts; adequate plant reduces weather risks; fit the plant to the job; estimate yardage accurately; compare labor costs with machine costs."

An advertisement by the Cook Motor Co. gives sage advice: "It's the idle time that costs—when your machinery is working, it's making money for you, otherwise you wouldn't have it."

An elevating grader (drawn by horses) was being advertised by Western Wheeled Scraper Co., the ad stating that "moving 1,000 cu yd a day is usual rather than unusual." Barber-Greene Co. advertised its "self-feeding bucket loader," forerunner of the large-capacity bucket loader of today.

A two-page spread ad extolled the merits of the Sterling wheelbarrow. (Sterlings are being advertised in CM&E today.)

It was the contractor's idea magazine then and some notable improvements have been made in 35 years. CM&E shall continue to serve construction men with the best ideas presented in the best way. It's a promise!

As It Was in the Beginning

NO ONE KNOWS EXACTLY WHEN THE FIRST SHEEPS FOOT ROLLER WAS BUILT ALTHOUGH IT MUST HAVE BEEN ABOUT 1907. THE TAMPING FEET WERE DESIGNED TO SIMULATE SHEEP'S FEET, HENCE THE NAME.

ODDLY ENOUGH THE ROLLER LOOKED REMARKABLY LIKE PRESENT DAY MAKES WITH MAJOR CHANGES PRIMARILY IN FOOT DESIGN.

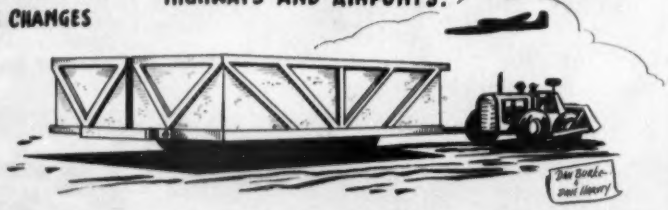
FOOT DESIGNS

The Sheep in Sheep's Foot Roller

AS FAR BACK AS THE ROAD-BUILDING ROMANS COMPACTION WAS RECOGNIZED AS A MUST BUT WAS ON A CATCH-AS-CATCH-CAN BASIS.

TO ACHIEVE THIS COMPACTION SHEEP OR HORSES WERE DRIVEN BACK & FORTH OVER FILLS.

TODAY HUGE RUBBER-TIRED COMPACTORS WEIGHING 200 TONS GIVE TREMENDOUS COMPACTION NEEDED FOR MODERN SUPER-HIGHWAYS AND AIRPORTS.



Boeing Airplane Co., Wichita, Kansas. Pozzolith Concrete used in apron and hangar. Consltg. Engr.—Wilson & Co., Salina, Kansas; Hangar Contr.—Manhattan Construction Co., Inc., Muskogee, Okla.; Hangar concrete supplied by Walt Keeler Concrete Co., Wichita, Kansas; Apron Contr.—Peter Kiewit & Sons Co., Wichita, Kansas, who also produced the concrete for apron.

120,000 Cu. Yds. of Durability...

POZZOLITH CONCRETE

Low unit water content and increased durability are among the important reasons for the wide use of Pozzolith Concrete in such projects as Boeing's 4,000′ x 800′ apron and many other types of exposed concrete work.

In tests conducted by the Nation's Highest Testing Authority, using a range of cements typical of all U. S. cements, Pozzolith Concrete specimens had up to 400% greater resistance to freezing and thawing than ordinary concrete.

Pozzolith, cement dispersion, provides maximum durability — with maximum economy — because it (1) *reduces unit water content* by approximately 15% (2) entrains the optimum amount of air and (3) fully complies with the water-cement ratio law — basis of ACI and ASTM procedures of design, specification and production.

Full information on Pozzolith and "see-for-yourself" demonstration kit supplied on request . . . without cost or obligation.

CEMENT DISPERSION ALSO KEY TO SUPERIORITY OF THESE MASTER BUILDERS PRODUCTS

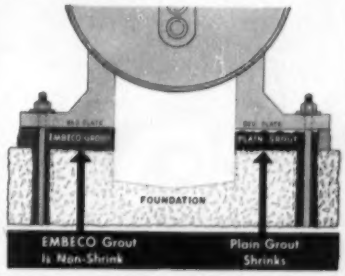
MASTERPLATE . . .

Masterplate produces "iron-clad" concrete floors with 4-6 times longer life; also spark-safe, non-dusting and easy-to-clean. Non-colored and colored. For new floors and resurfacing.

Section of Masterplate Floor. Note Thickness of Armored Surface

EMBECO . . .

Embeco (1) produces flowable, non-shrink, ductile grout which . . . (2) gives full, level, lasting bedplate contact . . . (3) helps avoid costly shutdowns.

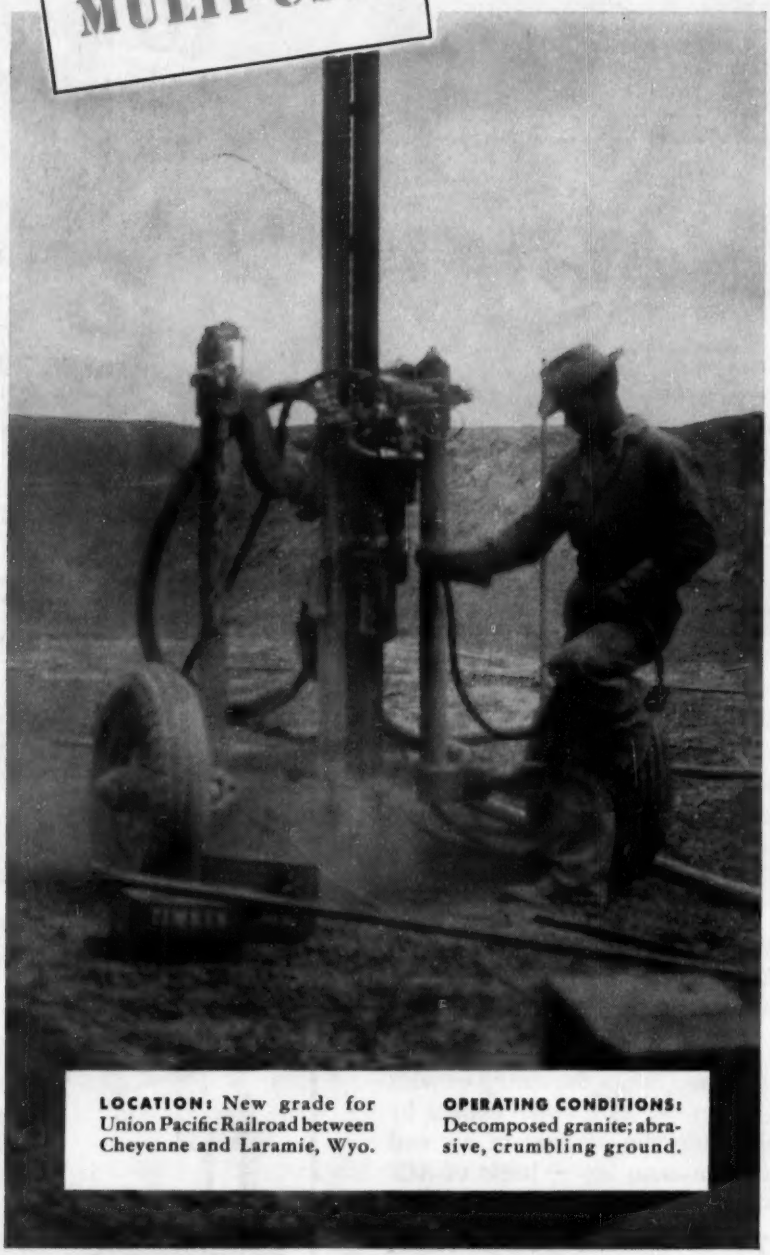


the MASTER BUILDERS

Subsidiary of American-Marietta Company

CARBIDE INSERT? *or* MULTI-USE?

Morrison-Knudsen made faster drilling time on this big railroad job with TIMKEN® carbide insert bits



LOCATION: New grade for Union Pacific Railroad between Cheyenne and Laramie, Wyo.

OPERATING CONDITIONS: Decomposed granite; abrasive, crumbling ground.

Morrison-Knudsen Company had a big project on the Union Pacific Railroad. They lowered the grade over Sherman Hill and completed about 38 miles of new grade in 12 months.

They tried various bits on this job and found that Timken® carbide insert bits gave them lowest cost per foot of hole drilled. They drilled decomposed granite—crumbling and abrasive. With Timken carbide insert bits they drilled faster and had fewer bit changes.

In hard and abrasive ground, you can always drill faster with Timken carbide insert bits. They're also most economical for constant-gage holes, small-diameter blast holes, or extremely deep holes.

But they're not *always* the most economical bit . . .

In ordinary ground, Timken multi-use bits are usually best. With correct and controlled reconditioning, they give lowest cost per foot of hole when you can drill full increments of steel.

All Timken bits, carbide insert and multi-use, are interchangeable in the same thread series. You can switch bits quickly and easily, right on the job.

To get the bits best suited to your drilling requirements, call on the Timken Rock Bit Engineering Service. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

...your best bet for the best bit ...for <u>every</u> job

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.